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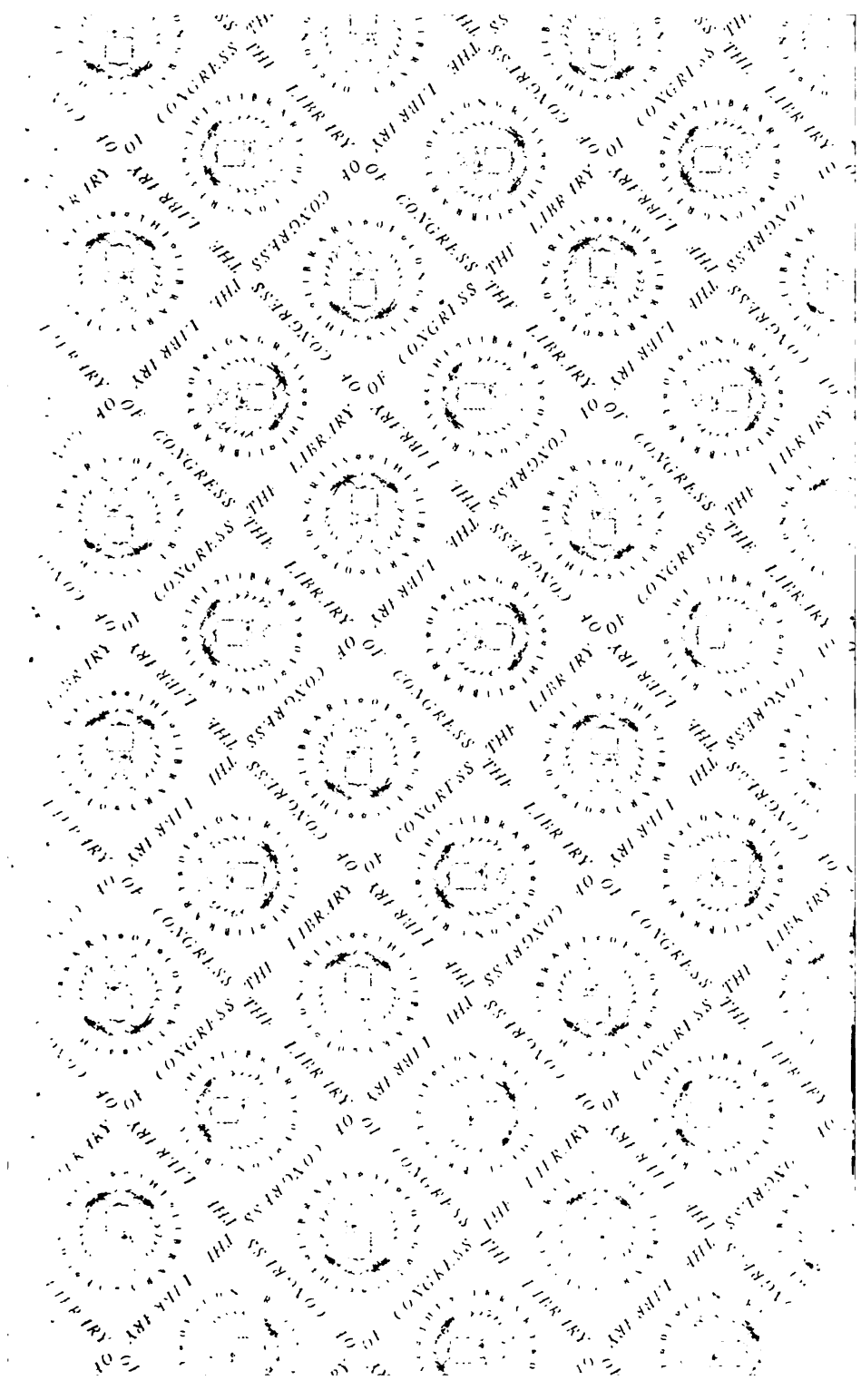
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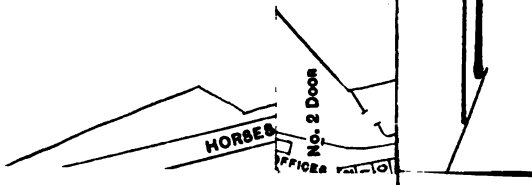








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**JOURNAL**  
**OF THE**  
**BATH AND WEST AND SOUTHERN**  
**COUNTIES SOCIETY.**

**FOURTH SERIES.**

**V O L. XII.**

**1901-1902.**

**WORK AND LEARN.**

**L O N D O N :**

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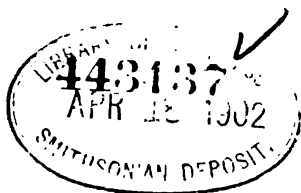
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"He that goes about to forward agricultural improvement must begin by finding out the reasons of what is called routine, or the 'custom of the country.' It sometimes happens that these reasons are only accidental, and then you may dismiss them fearlessly; but often it turns out that every-day practice rests on a solid foundation of facts; and then if you make an onslaught on local prejudices, they will be sure to beat you.

"The true course for the agricultural improver is, to take one step at a time, to gain a clear insight into facts by experience, not to try to go too fast, and to trust to the work of time.

"If practice which sets up to do without theory is contemptible, theory without practice is foolhardy and perfectly useless."--*From the Rural Economy of England, Scotland, and Ireland*, by LEONOR DE LAYRONE.

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JOURNAL  
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BATH AND WEST AND SOUTHERN COUNTIES  
SOCIETY.

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Original Articles and Reports.

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I.—*Agricultural Progress in the XIXth Century.*

By WILLIAM SOMERVILLE, M.A., D.Sc.

IN order to gain a clear idea of the development of the business of agriculture, and of the progress of agricultural science, during the last hundred years, it is, of course, first necessary to attempt to picture to ourselves the prevailing condition of things at the close of the XVIIIth and during the early years of the XIXth century. While sometimes, in the course of our review, we may feel inclined to question whether, in certain departments, agriculture has really contributed its full share to the wonderful developments that have characterised most branches of industry, at other times there is no room to doubt that solid progress has been made, progress, in fact, so conspicuous as to amount to little less than a veritable revolution.

One of the most prominent features of the agriculture of the XVIIIth century, and the first quarter of the XIXth, was the system of commons and open fields. Although, by means of local and special Acts, much uninclosed and common land had given place to individual holdings much earlier than the end of the XVIIIth century—and especially was this the case in East Anglia—it was computed that no less than 1,200,000 acres were, so late as 1795, farmed in England on the open-field system, and that an additional area of 7,800,000 acres was common, uncultivated, or waste.\* Under the open-field system the whole of the tillage land of a village or parish usually lay in one or more large fields, separated, it might be, by a turf wall, or some

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\* Report of Select Committee, April 27, 1797.

other form of fence, from the common grazing ground, but with no permanent line of demarcation between one man's land and that of his neighbour. Of this arable land one-third was fallow, one-third was under wheat, and one-third was under barley (or oats, rye, beans, or peas). From the sowing of the wheat about November, till the crops were reaped in the following year, the tillage land was guarded against stock, but at other times the cattle of the community grazed in common over the stubbles and fallows. However interesting, historically, the system of common land may be, it is quite indefensible from the economic point of view. To enumerate a few of the drawbacks associated with this style of farming we have—the loss of productive ground due to the relatively large area occupied by the baulks and other forms of demarcation between adjoining strips; the loss of time in going from plot to plot; the impossibility of cross-cultivating narrow portions of ground; and the stifling of individual efforts at improvement through the agency of drainage, weeding, and manuring.

But, worst of all, the open-field system of cultivation, bound up as it was with the grazing of the tillage fields by stock during the autumn of each year, made the cultivation of roots and clover impossible, and without these two types of crop a rational rotation was absolutely precluded.

And not only was a common interest in arable land fatal to agricultural progress, but the same held true in regard to the common pasturage of live stock. The opportunities for the judicious mating and selection of animals—which, combined with a liberal diet, are the basis of improvement in live stock—were altogether absent under a system of common grazing. Disease, too, would necessarily be rife amongst flocks and herds into which any member of a community had the right to turn animals of doubtful health, if not actually suffering from a specific ailment. So detrimental was the system to the interests of stock-breeding that, as Sir John Sinclair, the first President of the old Board of Agriculture, pointed out in 1795, it was found more profitable to hire enclosed land for the breeding of the better classes of sheep than to turn them on to the commons for nothing.

When, therefore, the growth of population, and the general requirements of the country, supplied the incentive to increased agricultural production, the era of the open-field type of farming was doomed to pass away, even if the period of transition to separate ownership should be marked by many cases of individual hardship. Although the change had been slowly working ever since Tudor times, the credit of effecting a complete revolution rests with that very remarkable man, Arthur Young.

Born at Bradfield, near Bury St. Edmunds, in 1741, he engaged for some years in farming without much success, and in 1768 he began his series of tours throughout England, Wales, Ireland, and France, which are chronicled so carefully in his voluminous reports. Few men have observed more carefully than Young, and his writings are a valuable mine of information to all students of industrial history. In his many travels Young was everywhere impressed with the impossibility of improving agriculture under the common or open-field system, and his writings and pleadings were powerfully instrumental in stimulating inclosures, as well as encouraging the creation of large farms. From the beginning of the reign of Queen Anne, till the death of George II. in 1760, the area inclosed amounted to less than 400,000 acres; while during the reign of George III., over six and a quarter million acres were withdrawn from the commons, open fields and wastes, the bulk of such inclosure taking place after the passing of the General Inclosures Act of 1801.

Arthur Young's account of his journeys to the North, West, and South of England, to Wales, Ireland, and France, did much, at a time when few farmers moved beyond the bounds of their own parish, to spread a knowledge of improvements in agriculture. It is not to be supposed that farmers showed any greater desire then than they do now to make themselves acquainted with current agricultural literature; but many of the landowners were ready enough to adopt ideas that promised to improve the productiveness of their estates. Such a man, for instance, was Coke, of Holkham, in the county of Norfolk—afterwards Earl of Leicester—who in forty years had the satisfaction of seeing his estate increase ten-fold in value. This marvellous change was due to a variety of causes, of which the extension of root-cultivation, the folding of sheep, and the security which his tenants enjoyed under long leases, were the chief. A function, inseparably associated with Holkham, was the famous annual sheep-shearings. In his early life Coke, feeling the need of counsel and advice in his extensive agricultural operations, began, in 1778, to invite a selected number of the best agriculturists of his acquaintance to visit him when his flocks were being shorn. The advantages of such meetings were mutual, and no doubt Coke's visitors carried away more information than they brought. To appreciate the importance of the Holkham gatherings, we have to remember that they were held at a time when the modern agricultural show and exhibition of live stock was unknown as an educational factor, while agricultural periodic literature had hardly begun to appear. By the year 1818 the Holkham sheep-shearing had become so famous as to

attract hundreds of agriculturists from all parts of the world. Imitators were found amongst other great landlords, notably the Duke of Bedford, whose gatherings at Woburn are no less famous than those at Holkham.

The Society of Improvers in the Knowledge of Agriculture was established in Scotland in 1723, and the latter part of the XVIIIth century saw the birth of the best-known—with the exception of the Royal Agricultural Society of England, which was founded in 1838—of our agricultural associations. The Bath and West of England Society was founded in 1777, the Highland and Agricultural Society of Scotland in 1784, and the Smithfield Club in 1793, while in the last-named year the Government of Mr. Pitt created the first Board of Agriculture. Who, but Arthur Young, could have been Secretary of this Board?—and the official position he thus secured was speedily turned to the best account. Inquiries of various kinds were set on foot; and, more particularly, selected agriculturists were commissioned to make reports to the Board on the condition of the landed interest in many of the counties of Britain. In various other ways the Board did most useful work, and more than justified its existence. But it fell on the hard times that followed the Napoleonic wars, and in 1820 its subsidy of 3,000*l.* was withdrawn, a course that was followed by its suppression in 1821. For nearly seventy years a special Government office, charged with the care of agriculture, remained in abeyance, to be revived with enlarged powers, and, let us hope, greater permanency, in 1889.

Towards the end of the XVIIIth century, and up to about the year 1817, the business of farming was, on the whole, highly prosperous and extremely popular. Mr. Prothero, in his valuable work, "*The Pioneers and Progress of English Farming*," gives some telling instances of this popularity. "Farmer George" (King George III.) "contributed articles, under the signature of Ralph Robinson, to Young's '*Annals of Agriculture*,' kept his model farm at Windsor, and experimented in stock-breeding. . . . Fox, in the Louvre, was lost in consideration whether the weather was favourable to his turnips at St. Anne's Hill. Burke, though he directed his sarcasm against the Duke of Bedford's devotion to agriculture, was seen by Young experimenting on carrots as a field crop on his farm at Beaconsfield, Lord Althorp, in the present century, worthily maintained the traditions of his official predecessors. During a serious crisis of affairs, when he was Chancellor of the Exchequer, John Grey, of Dilston, called upon him in Downing Street upon political business. Lord Althorp's first question, eagerly asked, was, 'Have you been at Wiseton on your way up? Have you seen

the cows?' No new book escaped the vigilance of agriculturists. Miss Edgeworth's *Essay on Irish Bulls* had not been published three days when it was ordered by the Secretary of the Bath and West of England Society of Agriculture. Nor were the clergy less enthusiastic. An archdeacon, finding the churchyard cultivated for turnips, rebuked the rector with the remark, 'This must not occur again.' The reply, 'Oh no, sir, it will be barley next year,' proves that the eighteenth-century clergy were at least zealous for the rotation of crops."

At the end of the XVIIIth century, and the beginning of the XIXth, not a few of the pioneers of agricultural progress recognised in education and experiment the most important agency for future advance. Thus, the second President of the Board of Agriculture, writing in 1800, strongly urged the establishment of an experimental farm, with an annual subsidy of 500*l*. The establishment of this farm is, he says, "an essential link in the chain of the future operations of the Board. . . . I pledge myself that if I may, as an individual, be allowed the honour of interfering in the management of such a farm, it shall, under the blessing of Providence, pay its rent."\* In the same year he further writes: "A Roman writer, Columella, complains that every art was taught methodically, whilst that of husbandry was neglected. And so, to this day, the same complaint may, with equal truth, be made. Husbandry should form a more leading part of our education at public schools."† Deploping the want of Professors of Agriculture at the Universities of Oxford and Cambridge, he says, "And yet of those educated at each, one-third possibly will have no other employment than to take care of their own estates, and from the want of which early knowledge they are driven to depend on those whose interest it too often is to mislead them. Another third part of our young men educated at universities are allotted to professions, in which a knowledge of husbandry would be of infinite utility."‡

In their Report to the Board of Agriculture on the agriculture of the county of Northumberland, Messrs. Bailey and Culley, writing in the closing decade of the XVIIIth century, thus express themselves on the subject of experimental farms:—

"Nothing would tend so much towards forwarding the perfection of agriculture in all its branches as public farms in every county conducted by proper persons, and as the gentlemen of large landed property would be the most interested in the results of such an institution, they certainly ought

\* Lord Somerville, *"Illustrations, &c., of the Board of Agriculture,"* p. 13.

† *Ibid.*, p. 146.

‡ *Ibid.*, p. 150.

to be the guardians and supporters of it. The principal expense would be at its first institution; when once got into a proper system it would require little, if any, further aid. If estates of 500*l.* a year and upwards were only to contribute 10*l.* per thousand yearly rental, it would, in this country, raise a sum sufficient for setting forward the undertaking. We suppose the farms to contain from 700 to 1,000 acres of various sorts of land, some mountain pastures, and an opportunity of converting a part of it into watered meadows. We know situations of this sort that might be rented for 500*l.* or 600*l.* a year. A farm of this kind would not only be a school, where youth might be instructed in agriculture, but even experienced farmers might often visit it with advantage, to learn the results of new experiments, and adopt those that promised to be useful. It would be easy to enlarge on this subject, and suggest many useful appendants to such an institution, should the gentlemen of landed property ever think of carrying a scheme of this kind into execution."\*

Other contemporary writers could be quoted to show that a hundred years ago a considerable number of enlightened agriculturists were advocating the claims of agricultural education, and not altogether without a certain measure of success. In 1790 the Chair of Agriculture and Rural Economy in the University of Edinburgh was founded and endowed by Government with 150*l.* a year, and for more than a hundred years it has exercised an unobtrusive but stimulating influence on the farming practice of the whole of Britain. This, then, may be regarded as the oldest endowment for agricultural education in this country. In 1796, Professor Sibthorp, of Oxford, died and left funds to endow a Chair of Agriculture in that University; but it would appear that the endowment is insufficient for the maintenance of the work of teaching and research that ought to be associated with a fully equipped Chair. It was not till 1842 that the Royal Agricultural College was established by private subscription, and from that time till the closing decade of the XIXth century, there has been no great extension of education in agriculture in this country.

As the end of the XVIIIth century witnessed the formal initiation of education in agriculture, so it was also the period that gave birth to the scientific literature of the subject. It is true that long before that time Fitzherbert, Tusser, Markham, Blith, Weston, Hartlib, Tull, and others, had described the agricultural conditions of various districts in this and other

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\* "General View of the Agriculture of the County of Northumberland," first edition (1794), p. 192.

countries, or had recorded their views on tillages, crops, and stock. But it was reserved for Lord Dundonald to give shape to the idea that was doubtless gradually forming in the minds of the philosophers of that period, and to emphasise, once for all, the dependence of agriculture on chemistry. This he did in two works, the one, "A Treatise, showing the intimate connection between Agriculture and Chemistry," published in 1795, and the other, "The Principles of Chemistry applied to the Improvement of Agriculture," which saw the light four years later.

The closing years of the XVIIIth century may thus be said to have recognised the important connection that exists between chemistry and agriculture, and it is the agricultural glory of the XIXth century to have effected its consummation. The century that has just closed was but two years old when the Board of Agriculture invited Sir Humphry Davy to expound before them the scientific basis of the farmer's business, and this he did with so much acceptance that he continued to discourse to the Board annually up to 1812. In the following year his lectures were published under the title "Elements of Agricultural Chemistry," and rapidly ran through several editions. Their influence on agriculture was immediate and far-reaching. They shed a fresh light on the farmer's business, and lifted it permanently out of the slough of empiricism. To Davy must be given much of the credit for the enunciation of the formula, "Practice with Science," which has been so appropriately adopted as the motto of our leading English Agricultural Society.

So epoch-making were Davy's lectures, that no excuse is necessary for devoting some time to an examination of his views. His definition of the uses of science as an aid to agriculture is as fine as anything that has ever appeared in any language. His words are "Science cannot long be despised by any persons as the mere speculation of theorists, but must soon be considered by all ranks of men in its true point of view, as the refinement of common sense guided by experience, gradually substituting sound and rational principles for vague popular prejudices." Although a chemical philosopher, with no claim to practical acquaintance with agriculture, he is ready to admit that science alone is a poor staff for a farmer to lean on. In this connection, he says: "It is no unusual occurrence for persons who argue in favour of practice and experience to condemn generally all attempts to improve agriculture by philosophical inquiries and chemical methods. That much vague speculation may be found in the works of those who have lightly taken up agricultural chemistry, it is impossible to deny. It is not uncommon to find a number of changes

rung upon a string of technical terms, such as oxygen, hydrogen, carbon, and azote, as if the science depended upon words rather than upon things. But this is, in fact, an argument for the necessity of the establishment of just principles of chemistry on the subject. . . . It has been said, and undoubtedly with great truth, that a philosophical chemist would most probably make a very unprofitable business of farming; and this certainly would be the case if he were a mere philosophical chemist; and unless he had served his apprenticeship to the practice of the art, as well as to the theory. But there is reason to believe that he would be a more successful agriculturist than a person equally uninitiated in farming, but ignorant of chemistry altogether. His science, so far as it went, would be useful to him. . . . In proportion as science advances all the principles become less complicated, and consequently more useful. It is then that their application is most advantageously made to the arts. The common labourer can never be enlightened by the general doctrines of philosophy, but he will not refuse to adopt any practice, of the utility of which he is fully convinced, because it has been founded upon these principles. The mariner can trust to the compass, though he may be wholly unacquainted with the discoveries of Gilbert on magnetism, or the refined principles of that science developed by the genius of Aepinus. . . . The great purpose of chemical investigation in agriculture ought undoubtedly to be the discovery of improved methods of cultivation. But, to this end, general scientific principles and practical knowledge are alike necessary. The germs of discovery are often found in rational speculations; and industry is never so efficacious as when assisted by science. Many of the sciences are ardently pursued, and considered as proper objects of study for all refined minds, merely on account of the intellectual pleasure they afford, merely because they enlarge our views of nature, and enable us to think more correctly with respect to the beings and objects surrounding us. How much more, then, is this department of inquiry worthy of attention, in which the pleasure resulting from the love of truth and of knowledge is as great as in any other branch of philosophy, and in which it is likewise connected with much greater practical benefits and advantages." Such are the views of Sir Humphry Davy, expressed in the first decade of the XIXth century, and they are as true to-day as they were then.

As Arthur Young about the same time was securing by his powerful advocacy the curtailment of commons, so Davy was successfully showing that the system of bare-fallowing prevailed to a quite unnecessary extent. Without going so far as Davy,

when he says: "It is scarcely possible to imagine a single instance of a cultivated soil, which can be supposed to remain fallow for a year with advantage to the farmer," it may readily be admitted that the cases where the process is justified are exceptional. But a hundred years ago it was the custom to let much of the land lie in fallow once in three or four years, so that about one acre in three or four of the total arable area was constantly in an uncropped condition. The teaching of Davy, the extension of green crops, and the introduction of drainage, have, during the century, produced a marked change in this respect, so that in 1900 the proportion of bare fallow to total arable area in Great Britain had fallen to 1 in 50.

In many respects the state of scientific knowledge a hundred years ago was practically as perfect as it is now. The composition of the atmosphere, so far as oxygen and nitrogen are concerned, was accurately known, though the amount of carbonic acid gas was believed to be about three times as great as has proved to be the case. But the uses of the carbonic acid gas were well known to Davy, who says: "The principal consumption of the carbonic acid in the atmosphere seems to be in affording nourishment to plants," and that is precisely the scientific opinion at the present day. It would appear, however, that he did not recognise the atmosphere as the sole source of the carbon-food of plants, for he attributes part of the manurial effects of wood-ashes to the gradual consumption of charcoal by the roots in the form of carbonic acid.

As regards germination, also, Davy's views were entirely in line with present-day knowledge. His words are, "During germination starch is converted into sugar in the process; a substance difficult of solution is changed into one easily soluble; and the sugar, carried through the cells or vessels of the cotyledons, is the nourishment of the infant plant. . . . In the production of a plant from a seed, some reservoir of nourishment is needed before the root can supply sap; and this reservoir is the cotyledon in which it is stored up in an insoluble form, . . . and rendered soluble by agents which are constantly present on the surface." The most exacting plant-physiologist would not be prepared to question the soundness of that pronouncement, and, while he might amplify it, he could hardly illuminate it. Wheat rust was well known to be frequently associated with the presence of barberry bushes in the neighbourhood of fields, and the cause of the connection was, even then, at least suspected. Davy's experiments with powdered charcoal suspended in water led him to believe that plants can only take in their food in solution, and he specifically states that "the great object in the application of manure

should be to make it afford as much soluble matter as possible to the roots of the plant." The perception of this important fact had a far-reaching influence on the practice of cropping, manuring, and tillage.

Although the recognition of the fact that leguminous crops leave the land rich in nitrogen may not have been first made by Davy, he at least seems to have anticipated by more than half a century the experimental demonstration that such crops draw most of their supply of nitrogen from the atmosphere. In this connection he says: "Peas and beans, in all instances, seem well adapted to prepare the ground for wheat. . . . They contain, as appears from analysis, a small quantity of a matter analogous to albumen; but it seems that the azote [the old name for nitrogen], which forms a constituent part of this matter, is derived from the atmosphere. The dry bean leaf, when burned, yields a smell approaching to that of decomposing animal matter; and, in its decay in the soil, may furnish principles capable of becoming a part of the gluten of wheat." It is well that we should be reminded of this utterance of Davy's, for we are apt to imagine that Hellriegel and Wilfarth deserve all the credit for establishing the connection between the Leguminosæ and atmospheric nitrogen. We will not grudge these distinguished Germans their meed of honour so far as the demonstration of the symbiotic connection between these plants and their nitrogen-fixing organisms is concerned, but do not let us forget that the genius of an Englishman had, sixty years earlier, left but little more to learn.

It will thus be seen that, even so early as the first decade of the XIXth century, agricultural science had already been established on a firm basis. That there was still much to learn, as well as something to unlearn, goes without saying; but, on the whole, there was wonderfully little misconception about the views of Davy and his colleagues. In the whole of Davy's lectures there are but two or three points that serious exception can be taken to. If he committed himself to the statement that, "The alkaline sulphates and the earthy muriates are so seldom found in plants, or are found in such minute quantities, that it can never be an object to apply them to the soil," he only indulged in the absolute generalisation of what, under most circumstances, is an accepted fact. The point on which the views of Davy, and of his contemporaries, differed most from the state of knowledge of the present day, was in regard to the formation in plants of the more important organic substances. We know now that such substances can, in the case of higher plants, be formed only from the carbonic acid gas of the air acting in conjunction with other substances;

but in the beginning of the century it was generally considered that plants could take them in ready-formed by their roots. It was then held that when vegetable matter is incorporated with the soil—as, for example, in the process of green manuring—that the sugar, mucilage, and oil therein contained were at once taken up without change by the roots of a succeeding generation of plants. It was, in fact, because malt-dust, rape-meal, and seaweed contained much of one or other of these substances in a soluble form that they were considered to be valuable fertilisers.

Two of Davy's lectures were concerned with a discussion of the properties and uses of fertilisers. These he classified as manures of vegetable and animal origin (what are now called organic manures), and manures of mineral origin, or fossil manures. Of organic manures he mentions green crops, rape-cake, malt-dust, seaweed, straw, tanners' bark, wood-ashes, fish (including sticklebacks, which were caught in huge quantities in the fens), blubber, horn, hair, woollen rags, feathers, leather, blood, coral, soot, farmyard manure, and bones. Bones were then only coming into general use, and Davy thoroughly understood how they should be prepared when he said, "The more divided they are, the more powerful are their effects." When Davy's lectures were delivered guano was, in this country, hardly more than an object of curiosity; in fact, it was not till near the middle of the century that it became such a powerful instrument of agricultural production.

Of mineral or fossil manures Davy enumerates lime in its various forms (by far the most important of all), gypsum, sulphate of iron, common salt (especially such as had been used in the curing of fish), sulphate of potash, soot (whose beneficial influence he rightly ascribes as largely due to the presence of ammonia), and burned clay. He also mentions nitrate of potash, which, though undoubtedly a powerful manure, is but little used on account of its cost. It is not, however, on the ground of expense that Davy lightly sets this substance aside, but simply because its beneficial influence was vouched for by Sir Kenelm Digby, whom Davy characterises as "too speculative a writer to awaken confidence in his results." This is not by any means the only instance of a great idea suffering at the hands of its sponsor.

With hardly an exception these are precisely the manures enumerated by Hartlib in the middle of the XVIIth century. Nor did the fertilisers at the disposal of the English farmer undergo much extension till the second quarter of the XIXth century. The farmers' attention was first of all powerfully attracted to bones, the importation of which was practically nil

in 1815, but had risen to a declared annual value of one hundred thousand pounds in 1827, and more than six hundred thousand pounds in 1875. During the same period the annual imports of linseed and rape cakes had risen enormously. The imports of guano were quite insignificant in 1840, but by 1848 they reached 70,000 tons, while ten years later they amounted annually to more than 350,000 tons. The importations of nitrate of soda weighed less than 10,000 tons in 1848, whereas they now aggregate 140,000 tons. Over and above our imports of fertilisers, the native sources have yielded enormously larger quantities in the latter half than in the first half of the century. Of these we have coprolites, once largely worked in the east of England, but now nearly exhausted; basic slag, a bye-product in the manufacture of steel from certain kinds of iron, once considered valueless, now regarded as one of the mainstays of the British farmer; and sulphate of ammonia, a bye-product in the manufacture of coal-gas and coke. The importation and manufacture of manurial substances have added largely to the productive capacity of English soil, and this is almost equivalent to an extension of our area. From reliable experiments, it is known that about 5 lbs. of nitrogen are capable of producing a bushel of wheat, and, as our available annual supplies of nitrate of soda and sulphate of ammonia (without reckoning other sources) contain about a hundred million pounds of nitrogen, these two substances alone must annually be producing about twenty million bushels of wheat, or the equivalent of some other food-stuff, and this may be put as the produce of about three-quarters of a million acres.

The opening years of the XIXth century were essentially a period of war, and the prices reached by agricultural products were altogether phenomenal. Wheat, during the period from 1800 to 1815, averaged over 90s. per quarter. Rents were raised, and labour was scarce, but still farmers flourished. With the cessation of hostilities prices fell rapidly, taxes of all kinds were high, and farms held on leases were greatly over-rented. The result was that within a few years many of the farmers and landowners in some districts were ruined. Wheat, which averaged nearly 110s. per quarter in 1813, was down at 44s. 7d. in 1822, and such a violent fluctuation in price was more than any industry could stand. During this period, and up to 1846, Parliament was constantly occupied with the question of agricultural distress. The main specific recommended was protection, and while this hardly helped the farmer, it seriously stifled trade. But the evidence laid before the many Commissions of the period shows that it was the farmers of the wheat lands that suffered most. Those who

occupied light land, like the soils of Norfolk, were benefited by the extension of root cultivation, the improvement of stock, the spread of drill husbandry, and the aid that science was conferring through discoveries in manures. The country had become aware of the potential wealth lying dormant in the extensive coprolite-beds of the eastern counties, though in its natural state the phosphate of these nodules was of little use as plant-food. But between 1840 and 1843 Liebig, Lawes, and Henslow showed that treatment with sulphuric acid produced a substance rich in soluble phosphate, and the invaluable fertiliser, superphosphate of lime, was the result. The same process applied to bones practically doubled the efficiency of the raw material.

Of no less importance to agriculture was the demonstration about 1830 by Smith, a Perthshire farmer, of the value of underground field drainage. By 1845 the modern type of drain-pipe had been discovered by Reed, and these could be produced rapidly and cheaply by Scragg's machine. Parliament came to the assistance of landlords with loans for drainage, and enormous areas were relieved of their superabundant moisture. It has already been pointed out that manures have practically extended the area of our islands, and the same may be said with regard to drainage. Much wet land could not be cropped at all, enormous areas were bearing only half the yield of which they were capable, the expenses of working were disproportionately high, and for many weeks in each year neither man nor horse could set foot on the water-logged fields. To these drawbacks may be added the facts that, on wet land, manures acted capriciously, while man and beast were constantly being prostrated by disease.

From the beginning of the century, and earlier, on to 1846, Parliament was constantly attempting to improve agriculture by means of taxation on imported grain. It would take too long to examine the main provisions of even the principal of these Acts, suffice it to say that the first Corn Law of the century—that of 1804—imposed an import duty on wheat of only 6*d.* per quarter when the price of home-grain was 66*s.* per quarter or more: but the duty rose to 24*s.* 3*d.* per quarter when the price fell below 63*s.* With slight modifications of the scale, and with a differential tariff in favour of Canadian grain, protection governed the fiscal policy of the country till 1846, when the only shred of protection that was left was 1*s.* per quarter upon all kinds of grain.

It was generally anticipated that free importation of corn would be the ruin of farmers and landowners alike, but this, like most economic prophecies, has proved incorrect. The

average price of wheat during the twenty years preceding 1848 (free trade in corn did not come into full operation till 1849) was 57s. per quarter, which compares with 52s. during the twenty years immediately succeeding 1848. The general anticipation of evil, and the consequent despondency, induced the *Times* in 1850 to appoint a Commissioner (Mr., afterwards Sir James Caird) to travel throughout the whole of England and report upon the condition and prospects of agriculture. This report forms a most valuable picture of the rural economic life of England exactly in the middle of the century. and is of special interest when viewed in the light of the reports published half a century earlier by Arthur Young, and of present-day experience. As was to be expected, Caird found that the practice and results of agriculture varied greatly in different districts. It may be noted that in no part of England did he find the state of things so bad as in Cambridgeshire. Here is the record that he has left. "The farm buildings are chiefly wood and thatch, antique and inconvenient; and, from the combustible nature of their structure, both very tempting and very subject to the fire of the incendiary. These incendiary fires are said to be of almost nightly occurrence in this and the adjoining part of Huntingdonshire. Many of the farmers live in constant apprehension of them, and, with their families, are kept in a state of nervous excitement which we had not expected to find in any English county. The corn ricks are built in different parts of the fields, seldom contiguous, so that if one should be fired the rest may have some chance to escape. One farmer had his buildings three times burned, and the insurance companies now decline to insure them. The culprits generally escape detection. . . . In any district of England in which we have yet been, we have not heard the farmers speak in a tone of greater discouragement than here. Their wheat crop, last year, was of inferior quality, the price unusually low, and, to add to this, their live stock and crops are continually exposed to the match of the prowling incendiary. . . . To say that, in a district within fifty miles of London, property is so insecure, and even life in some degree of hazard, is to tell us of a country in a semi-barbarous state. A man might as well expose his life to the risk of a shot from a Tipperary assassin as live, like a Cambridgeshire farmer, in a constant apprehension of incendiarism." \*

But, in contrast to this picture, we find many which show that English agriculture in 1850 was being conducted with industry, intelligence, and success. In his concluding remarks, Caird

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\* Caird, "English Agriculture in 1850 51," p. 467.

states the opinion that "we see no reasons to despond, but many to encourage hope, in the future prospects of British agriculture." His remarks upon education are worthy of quotation, and it will be seen that they are almost identical with those uttered fifty years earlier by the President of the Board of Agriculture. He says, "The present age is eminently practical. Every business in the country requires previous application, in those who practise it, to render it profitable. The labourer must perfect himself by years of patient application in the peculiar department of work in which he hopes to excel. The tradesman must serve his apprenticeship, the professional man must study and work hard to obtain a knowledge of his business. The success or failure of these men affects themselves only. But the landlord's influence for good or evil extends to his tenants and labourers, and, in its general results, regulates, in no unimportant degree, the productiveness and welfare of the country. Yet of all classes in the community he is the only one who receives no special training. Our great universities offer him no peculiar instruction to fit him for the important functions of his station. He comes to it frequently without knowledge of his duties; and, with a consciousness of his own inability to perform them, he resigns all into the hands of his agent. . . . To education in its widest sense we look as the most powerful aid in the farther progress of British agriculture."\*

The abolition of the Corn Laws in 1846 may be taken as the critical date in the history of the agriculture of the century. Since that time its progress has been steady, and for many years its results were satisfactory. It is not that in the latter half of the century agriculture has been furnished with any new aids, but rather that existing aids have been more generally and fully utilised. The extensive agriculture of the thirties gave way to the intensive agriculture of the sixties. When most of the commons had been appropriated, increased production was possible, not by enclosing more land, but by getting more out of the existing fields. In the first half of the century, the diffusion of knowledge was so slow that improvements in one county might never appear in the next. The improvement of roads, the construction of railways, the establishment of agricultural societies and shows, the extension of literature, and the spread of education, have all tended to place farmers in the position of being acquainted with the most recent developments of their business. Knowledge of the manures which science discovered spread so rapidly that, although it was only in 1843 that Lawes began the manufacture of superphosphate, its use

\* Caird, "English Agriculture in 1850-51," p. 492.

seems to have been general amongst the best farmers in 1850. The extended use of improved manures was accompanied by the adoption of improved varieties of crop. How much the yield may have been increased by the efforts of plant-breeders, like the Lawsons, Chevalier, Shirreff, and others, it is difficult to say, but the experiences of the present time show that possibilities in this direction have by no means been exhausted.

An important and growing feature in modern agriculture is the universal use of implements and machinery. Ploughs, drills, harrows, and horse-hoes have all been markedly improved in efficiency, the steam-thrasher has superseded the horse-gin, as the latter had previously displaced the flail; and now we have the self-binder doing the work of a dozen men. The extended use of agricultural machinery is partly the cause and partly the result of considerable rural depopulation; but the labour thus freed from agriculture must have been turned to national advantage in other industries. The lot of the rural labourer may even now not be an ideal existence, but we may at least admit that it has recently tended in the direction of steady improvement. Before Free-Trade times the cost of living was much higher than now, the facilities for elementary education were much less ample, and labour on farms was uncertain and fluctuating. Labourers at the beginning of winter were constantly reduced to the condition of paupers; whereas now, a greater variety of crops, improvements in tillage, and especially the extension of stock breeding and feeding, necessitate a steady supply of labour throughout the year.

One of the main features of the agriculture of the last fifty years has been the increasing amount of attention that has been given to live-stock. There are difficulties in the way of the importation of meat, dead or alive, that do not operate in the case of grain. Moreover, a rise in the standard of living amongst artisans, as a result of industrial prosperity, has created an increased demand for meat, with higher prices. As a consequence, the corn-farmers have felt the pinch of foreign competition much more keenly than the stock-breeders. In proof of this, we have only to compare the prices of corn and meat prior to 1846 with those prevailing, say, thirty years later. Thus, while the average price of wheat was 50s. 2d. a quarter in 1843, and 58s. 8d. in 1873—a rise of 17 per cent.—the best beef in Smithfield Market had, in the same period, risen from 6s. 9d. to 10s. 6d. per stone, a gain of 55 per cent. It has therefore been a characteristic feature of the agricultural tendency of recent years that more and more of the crops of the farm have found their way to market in the shape of beef and mutton. Farmers who, on account of circumstances or preju-

dice, adhered to grain-growing, have certainly fared worse than their more adaptable neighbours, and even now, when, by the aid of science, a herd of about a million and a half of cattle, and a flock of some seven millions of sheep, are being annually landed on our shores, the stock-farmer has still the best of the situation.

Any sketch of the agriculture of the century would be lacking in a main essential if it did not include mention of the experimental work conducted at Rothamsted. This station, the oldest and most famous of the many now devoted to agricultural research, was started by Sir John, then Mr. Lawes, shortly after he had succeeded to his hereditary property in 1834; and, from the first, the whole expenditure was borne by the owner. In experimental work conducted in the open field, continuity in the operations is a matter of prime importance, and it would have been more even than a national calamity if the historical sequence, which had been established during more than fifty years on the classic fields of Rothamsted, should ever have been in danger of interruption. Such a catastrophe has, however, been placed beyond contemplation by the action of the owner, who, besides the land, vested in trustees the sum of 100,000*l.* to carry on the experimental work which his far-seeing genius inaugurated.

There is no department of agricultural knowledge that the results obtained at Rothamsted have not enriched. The publication and discussion of these results has been perhaps the most important feature of English agricultural literature during the last fifty years. Many of the reports and papers, which number, in all, considerably over a hundred, have long since taken their place amongst scientific classics. Of these, the best known are "Liebig and the Mineral Theory," the "Agricultural, Botanical, and Chemical Results of Experiments on the Mixed Herbage of Permanent Meadow Land," sometimes known as "The Battle of the Meadow," "The Sources of the Nitrogen of Vegetation," "Rainfall Evaporation and Percolation," "Nitrification," "The Composition, Value, and Utilisation of Town Sewage," "The Sources of Fat in the Animal Body," "The Feeding of Animals," and many others.

A large amount of attention has been given by the Rothamsted investigators to the question of the valuation of the capital committed to the soil by tenant farmers. This is a subject that could hardly have been discussed in the first quarter of the century, when little was used on the farm beyond what the farm produced. But during the past fifty years high-farming has made it necessary for the farmer to commit much of his capital to the soil in the shape of manures

and other forms of improvement, and much hardship was often occasioned by his being forced to abandon such capital, without compensation, to his successor. Acts of Parliament, passed in 1875 and 1883, have dealt with this subject, and the agricultural interest of the last Parliament of the century largely focussing on an amending Bill. The close of the century, in fact, has witnessed legal recognition of what was formerly somewhat uncertain customary practice; while fixity of tenure has, with certain limitations, been granted to Ireland and the Crofter Counties of Scotland. What developments the XXth century may hold in store it would be hazardous to attempt to predict.

## II.—*American Farm Implements.*

By PRIMROSE McCONNELL, B.Sc., &c.

I MAY at the outset remark parenthetically that I use the word "American" in its general sense to include both Canada and the United States. Although the two countries have no connection with one another politically, yet their farming and farm implements are pretty much alike, and, as I am not able to differentiate between the two, nor say that a particular implement is used in the States and not in Canada, or *vice versa*, I use the general term to include both countries.

### HAYMAKING

I allude to haymaking first, because of its importance as one of the great harvesting operations of the year.

Some eight years ago I had my attention called to the "Sweep-rake" by Mr. Speir, of Newton, Glasgow. As made in America by the original inventors it would not work on a heavy damp English crop, but after some experimenting I found how it could be improved and made workable, and have now for the last seven years dispensed with carts (or waggons) in carrying the hay. The illustration (Fig. 1) shows a general view of this implement. The horses move forward at a walking pace and scoop up a row of cocks, a windrow, or even the hay lying in swathe if necessary, and then drag it to the stack. An ordinary load is two-thirds of a cart-load, but a double load can often be dragged in where it is downhill. Formerly I worked it in conjunction with an elevator, but as I found that two men could rarely fill the hay into the hopper as fast as two sweeps



Fig. 1.

brought it up, I determined in 1899 to procure the stacker, which was intended to work as the complement of the sweeps. Accidentally I discovered that a neighbouring agent had actually imported one and had it in stock. This I bought, set up, broke, set up again, wrecked, repaired again, and finally got it to work, and now for two years my hay (some 250 to 300 acres) has all been carried and stacked by seven men and a boy. As the stacker, however, only goes 25 feet high, which is not sufficient for large stacks, I intend this year to have the apparatus combined with an elevator, so as to have the speed of the stacker handling hay in 1000-lb. loads combined with the height of the elevator. Messrs. Cottis, of Epping, took up the making of these "sweeps" some years ago, and now I believe there are several hundreds at work, so that there can be no question of the success of this system of hay-gathering, in the south of England at least.

With respect to horse-rakes, the future development will be in the matter of width, so that one man may get over as much ground as possible. The American wide horse-rake is made for two horses, yoked with a pole between, and though I have not as yet come across any more than 12 feet wide, I know that two American firms contemplate bringing out a 16-foot or 18-foot size. These are not telescoping or collapsible—always a weak form—but are moved endways through a gateway on a light sleigh. An 8-foot rake is enough for a small farm. It takes two ordinary swathes in its width, but a 16-foot one will take four, or three 5-foot swathes, and one man can work the lot with his own pair of horses, thus saving a man.

The light flexible spring-steel-toothed rake is an American invention, and the majority of them are still imported, though some English makers have now taken up their production. The horses in common use on American farms are of a much lighter type than ours—more like nags or coach-horses—and thus while one horse of our heavy cart types would be sufficient for a 12-foot rake of this light style, two are required there, with a pole between and yoked by whipple-trees. The application of this principle to the making of a rake wide enough and strong enough to suit a couple of our heavy horses, and to work with our heavy crops, is the next development.

There is another hay-saving implement which is coming into more extensive use in this country, and which has been introduced from America, and, so far as I know, is not yet made in this country at all. This is the loader, of which there are at least two forms offered for sale, one of which is shown in Fig. 2. This must of course be attached to a waggon prepared



with a frame or ribs to receive it, but it is perfectly successful in picking up the hay out of the swathe or windrow and delivering it on to the waggon. The trouble has generally been to find a man who is smart enough to take the hay and place it on the waggon as quickly as it is carried up. Where the hay is all stacked in a shed, or requires to be taken on carts or waggons through gates and along roads, some one of these loaders is the most convenient implement to use, while the adoption of a "holder," or frame for the cart, such as is shown in the illustration, does away with the difficulty of having to "build" the load on as formerly.

#### REAPING AND MOWING.

String-binders in our day have reached such a pitch of development in this country, as well as in America, that I am not prepared to say that there is any one of the latter superior, at least in every detail, to all the home made. This does not alter the fact, however, that the string-binder is an American invention. I am aware, of course, that the Appleby knotter used by some makers is claimed as English, but the implement as a whole was developed first in the States. In 1877 the Royal Agricultural Society of England held its first trials of (wire) binders, near Liverpool, and, though there were eight entries, only three—and these were all American, being entered by McCormick, Osborne, and Wood—faced the judges when the trials came off.

The oldest reaping-machine in the world is the reaping-hook, and it is remarkable how little change there has been in the shape and style, and even in the material of this, for thousands of years. Many people still continue to use it, and recognising the fact that it still has its uses for some kinds of work, and in some situations, makers continue to produce it in large numbers. It occurred to the Americans that it might be improved in some respects, and the result is a miniature Hainault, or Flemish scythe, such as was introduced into Scotland in 1825 by the Highland Society, but which did not "catch on," because the common or cradle-scythe was better. The application of the same principle to the reaping-hook, however, is a distinct advance.

With mowers there is little to choose between those of various makers, either home or American, and a farmer is, on the whole, perfectly safe in buying any one which he fancies or which is most conveniently obtainable or repairable in his locality. Among the improvements introduced by the American makers have been such details as raising the points

of the fingers, making these points as narrow as possible, linking the pole to the cutting-bar by an extra rod, having adjustable screws so that the alignment of the cutting-bar can always be kept at a true right-angle to the pole, attaching a spiral spring behind the whipple-trees, so that the jerkiness of draught is equalised, affixing a foot-trip whereby the knives can be lifted easily over small obstructions without stopping, &c. Some of these improvements are of course common to some English makes, and all American mowers do not have every one of them; but my point is that they are characteristic of the latter especially.

#### THRASHING.

The difference between thrashing in the States or Canada and our system in this country will be best illustrated if I describe one of the types of machine used out there. I do not refer to that of California and other sunny regions where the harvesting machine is combined with a thresher, and the grain is either "stripped off," leaving the straw standing, or else a short length is "headed" off and thrashed out as the machine travels along—propelled by from four to twenty horses, or even by a traction engine. I take as the type a case where the corn has been cut and bound by the string-binder in the usual way, stacked up, and is being thrashed by a portable "barn-work" driven by a portable engine. At the drum-end there is a self-feeder on to which the sheaves are thrown, and in which there are revolving knives to cut the bands. The drum is made on the Scottish peg-mill principle instead of that of the corrugated rubbing-bars, but the shakers are pretty much the same as in English makes. The great difference, however, is in the disposal of the products of thrashing. On to the end of the shakers is fitted a huge fan, into which the straw, cavings, and even the chaff are delivered and the whole is blown up a long spout and deposited some 12 to 20 yards away, where it piles itself up into a heap. Meanwhile the thrashed grain is carried up an elevator and delivered by a spout fixed high enough to run into a box-cart, and is carted loose to the granary. The whole arrangement is worked by eight men at most, including two to cart the grain away, and from 1,000 to 2,000 bushels of wheat are passed through daily.

In this machine there are only two delivery openings—one for grain and one for the straw and other etceteras. This contrasts favourably with the corresponding English-made "barnwork." I lately helped with the thrashing at my home, and had the curiosity to count the number of openings out of which the products of thrashing were delivered, and found there were

fourteen, and this on a machine which did not "finish" the grain, but only left it in a semi-cleaned state. Now this, to my mind, is simply an absurd complication of machinery involving a waste of labour, which we cannot stand much longer in these days of rural depopulation. Probably the division of a sheaf of corn into some six or seven parts in the shape of grain, tail-corn, straw, cavings, chaff, &c., is quite enough for all ordinary purposes; but in any case there is no need for duplicating the work and necessitating the use of twelve to fourteen men to run the concern. I am not for one moment thinking that an American "separator" (as they are called in the States) would suit us here just as it stands, because, for one thing, we want the straw delivered separate from the other materials, and we often want it tied up into trusses with string; but I do suggest that our home-made articles require very great modification from a labour-saving point of view, and these American implements are an example of how it can be done. They are also an illustration of how it is that Americans can produce wheat so cheaply. Their thrashing alone—though carried out in a style similar to ours and by highly-paid men—is not more than half as expensive as ours, owing to the fact that they are more up to date in their "notions."

All sorts of styles of threshing machinery are to be seen in the States, including those which truss or tie the straw into bundles (not by a separate machine, but by the tying arrangement being fitted into the thrashing machine); but there is one more noticeable difference between the home and American machines. This is in their respective heights. The American machine is not only a much smaller and lower one as a whole, but the self-feeding arrangement is still lower than the top of the same. This means that while the sheaves have to be pitched on to a feeding-table some 10 feet off the ground in the home machines, it is only necessary to reach some 6 or 7 feet high in the Transatlantic types. There is consequently an immense difference in the manual labour required, and, as the matter stands, the difference is all against us at home.

#### CHAFF-CUTTING.

It may surprise some to read that in such a comparatively old-established machine as a chaff-cutter there is any great room for improvement, or that the Americans are ahead of us in its adaptations. At the same time it is fair to state that I have found three English firms who, alive to the necessities of the case, have introduced the necessary improvements. Where

there is great need for improvement is in dealing with the "chop" after it is made. There are on the market chaff-cutters which can pass  $2\frac{1}{2}$  tons of hay through them per hour, cut into  $\frac{3}{8}$ -inch lengths, and probably double or triple that amount if cut into longer lengths. Now the question I have asked many makers is, what I am to do with this chop after it is made? No bagging apparatus I have ever seen at work could dispose of the chop as cut in  $\frac{7}{8}$ -inch lengths, and no gang of men ever born could carry the said chop away fast enough. I am told that the chaff-cutter is to be fixed on the second story so that the chop will fall down through a hole in the floor of the loft; but this involves pitching the hay or straw up on to that loft—a waste of labour which I particularly want to do away with. The answer is supplied by the American machines and those of the three English firms alluded to. A fan-blast arrangement is fitted on to the foot of the chaff-cutter, and the chop is blown up a pipe any reasonable distance and in any direction, while the chaff-bin can be filled up to the very roof without any manual labour at all. Where the position of the chaff-cutter is of no importance, elevator apparatus can be used, and I have seen it so used at the College Farm at Guelph, Ontario, cutting maize for ensilage and delivering the chop through a door in the roof of a two storey silo. Another pattern is that in which vanes are fitted to the rim of the fly-wheel, and the chop is "scuffed" up a pipe in the same manner as with the fan-blast. This pattern even Continental makers know of, for I saw one at the recent Paris Exhibition made by a French firm. The point is that the chaff-cutter—whether fixed or portable—must rest on the ground level, and deliver its own chop into the chaff-bin. While nearly every American maker has some variety of fan or elevator ready for attachment, this development of a labour-saving appliance is almost unknown in England.

#### PLOUGHING.

Within the last fifteen or twenty years there has been a complete change in the style of ploughs and ploughing adopted in many parts of this country, the alteration being altogether due to the introduction of American methods. The chilled-steel plough, the digging-plough, and all the varieties of the same, are American—indeed, many of them are yet imported from America for work on this side without any modifications whatever, while English (and Scottish) makers have found it desirable to bring out varieties copied from the American types. I have even heard it said that some import the chilled-steel

mouldboards to fit on to home-made frames, because the special kind or quality of steel cannot be made on this side.

I am perfectly well aware that every American plough is not superior to every British plough. I have had an opportunity of holding the plough on many different fields on both sides of the Atlantic, and I know that the implement which succeeds on the light fluffy black soil of the prairie would fail on the sticky clay of Essex; but the Transatlantic types or principles are improvements on our old-world ideas, and I am glad to say that our makers have now for many years recognised this and risen to the occasion. There is one other form of American plough, however, which I have not seen in this country yet, but which I believe is a great advance on anything we have hitherto had. Its peculiarity consists in having a revolving disc for the mould-board. Disc-cultivators or harrows, disc-coulters on corn-drills, and disc-coulters on ploughs, have all been so successful in practice that there is every reason to believe that the adoption of the principle in the wrest of the plough would be followed by success in this country as it has been in the States. A plough of this type would be valuable for ploughing-in dung or burying surface rubbish, and it is on sale by at least one agent in this country.

#### ( CULTIVATORS.

With respect to the value and effectiveness of American cultivators, it is only necessary to point to the fact that the now well-known and generally used spring-tine type is an invention brought from the other side of the Atlantic. The mistake has been in not making the tines strong enough to suit the cultivation of hard or cloddy clay, while I have heard it stated that even in this case the American tines are of better steel and less liable to snap than those of home manufacture. Even where the old-fashioned rigid tine has been retained it has been found an improvement to adopt the spring principle in some form or another, as we see in the first prize implement of the Royal Agricultural Society of England trials—where a rigid tine has a spring setting. The great beauty of this springiness is that it keeps the implement free from clogging where the land is weedy or has much surface rubbish. One of the latest forms of this implement to be obtained from at least three agents in the United Kingdom is the "Universal" cultivator, illustrated in Fig. 3. One of its advantages is that it goes with a pole and can be made narrow enough to be within the power of two horses. This will be a matter of importance in the future development of implements, as it is a mistake to

break up the working-couples of horses, for every horseman ought to stick to his own pair as far as possible. This particular implement is convertible and able to tackle four or five different kinds of work—as a common cultivator, as a horse-hoe taking

Fig. 8.

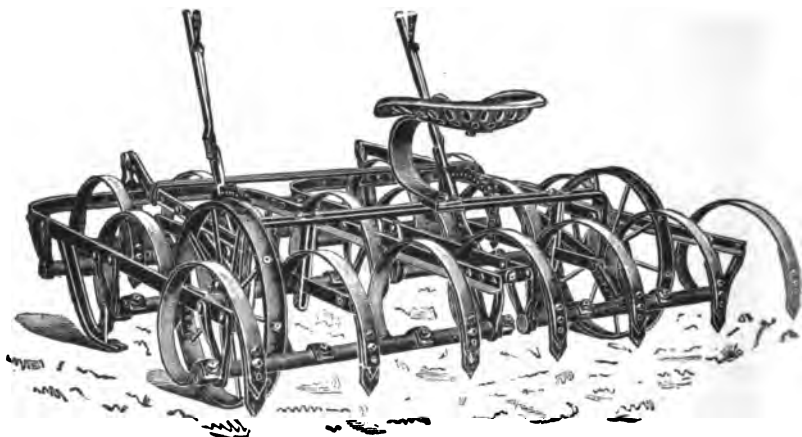


two or three ridges of roots at one time, as a ridging-plough making two or three at one time, and so on. The tines are rigid but have a spring setting for the frame, while three or more horses can be attached.

The principle of the spring-tine has been long adopted for harrows in America, and I can remember a friend of mine in Scotland importing a set, some twenty-five years ago. Nowadays there are plenty of makes to be had in the market, of which Fig. 4 may be taken as an example. The implement is a "live" tool in a way that can never be attained by the old-fashioned rigid-tine harrow, and I cannot understand why it has not come into more extensive use. The tines can be set at any angle, and their springiness prevents clogging with surface rubbish.

Another form which I have myself used for years and can thoroughly recommend, is the "Acme" harrow, which is an adjustable frame fitted with steel knives or blades and yoked

Fig. 4.



by a pole. I do not think it would suit stony or rocky land, or where the land is cloddy or "set" with drought, but for cutting up and pulverising a lea-furrow it is unequalled. I have in my own work seen one stroke of this do more good than four strokes with the common rigid-tined harrow.

A great point with all American cultivators, harrows, and implements of this class is the fact that they all are, or can be, fitted with wheels. The drawback is, that these wheels are mostly too small, for, by the laws of mechanics and from practical experience, we know that all wheels of this sort should be as large in diameter as possible.

Disc-harrows or pulverizers, again, are an American invention, and though they are now made by some firms at home, yet the disc in its general adaptation to farm implements is

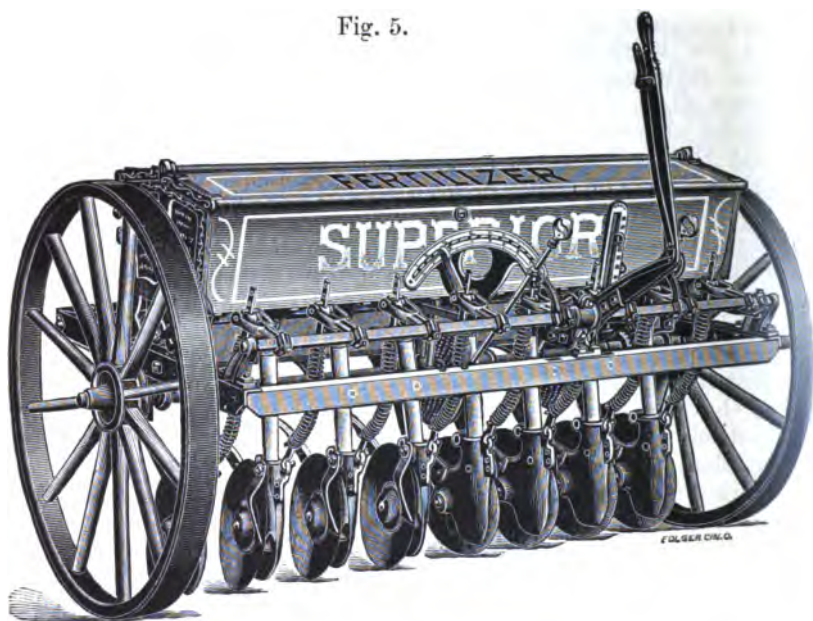
emphatically a "Yankee notion." Many of the makers on the other side, however, have long got past the plain disc style and have adopted varieties of segmented or cut-away discs. A further common development is to affix a seeder above the discs, and thus the land is cultivated, seeded, and the seed covered in all at one stroke. These disc contrivances are of course of most value on turfy or newly broken up land, where the soil can be cut with a knife, but will not tear to pieces with an ordinary harrow tine. Under such circumstances there is no implement to equal this, with the possible exception of the Acme harrow. The newly broken up land of the prairies and other new regions of America is tough and fibrous, and it was on such a soil that this implement was first thought of and developed. A yet further modification is to have each disc separately mounted on a spring setting instead of on one rigid spindle right through the lot, so that, where the land is rocky or stony, the implement works much steadier and better.

#### SEEDING.

Perhaps in no department of farm implements has there been a greater tendency to Americanise than in the case of the corn-drill. When I first came to Essex, now nearly twenty years ago, there was nothing to be met with but the Suffolk drill. This requires three men and three horses to handle, and I have even seen four men and four horses with it on heavy land. For many years I have used one of the light two-horse "disc-coulter" drills (Fig. 5) which sows the corn, manure, and grass-seed out of three separate boxes, all in one operation, and chain-harrows the surface of the ground behind at the same time; and the whole is controlled by one man if desired; but, though I do not require to do all those four things at once, I always allow two men. This style of drill is now being copied by some English makers, and it is capable of great improvements—some having already been introduced in its details; but the great advantage of using this and other American forms is the saving of labour.

I cannot understand why a certain modification of the coulter, called the shoe-coulter, is not adopted straight away by makers, even if they do prefer to adhere to the English style of drill. The ordinary English coulter is round and dumpy, like the bows of an old wooden man-of-war, eminently adapted for catching all surface rubbish and for increasing the friction of the passage through the soil. The other, which is long and

Fig. 5.

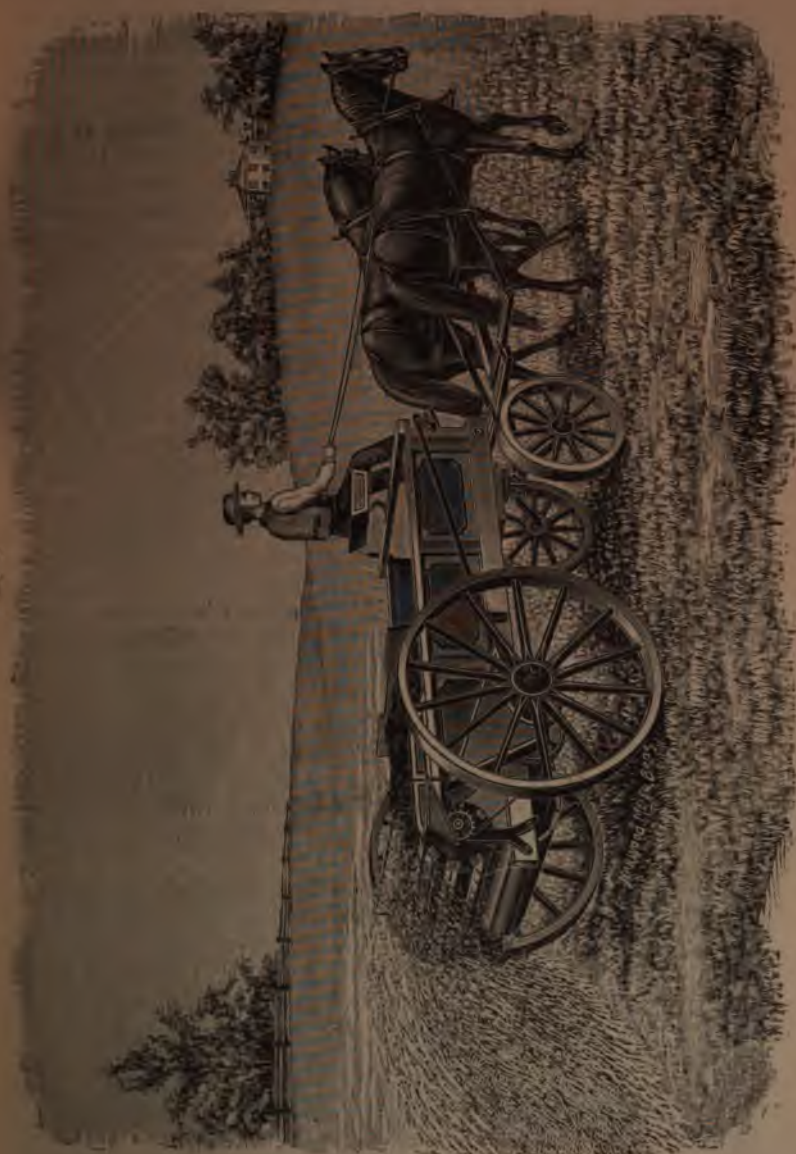


sloping like the bows of an Atlantic liner, cuts easily through the soil, and does not drive any surface rubbish in front of it.

#### DUNG-SPREADING.

At the Highland Society's Show at Dumfries in 1878 a dung-spreader, intended for affixing to a common one-horse cart, was exhibited. I cannot at this distance of time recollect who was the maker, but as I have never seen another implement of the same sort since, it would appear that it did not "take" in this country. It *did* take in the States, however, and in the accompanying diagram, Fig. 6, it is shown affixed to the ordinary American two-horse farm waggon. The principle is the same as the revolving hay-tedder, and the manure is pulled forward against the teeth by a moving bottom and back. Professor Henry, of Madison (Wis.), was over in this country in the summer of 1900, and I had an opportunity of asking him as to the practical success of this implement. He informed me that he knew of an English farmer in Wisconsin who was so well satisfied with the invention that he had procured three sets, and that he himself intended purchasing one for the College Farm. It would not be injured by stones as big as duck eggs

Fig. 6.



in the dung, and he believed it would even successfully tackle an occasional half-brick. The arrangement as it stands would of course need some modification for use in this country. For one thing, an American farm waggon would need to have much heavier wheels, while a one-horse cart is more conveniently handled in narrow walled-in courtyards. These, however, are details, and as the invention has succeeded in America it could no doubt be made to work here. That it would be an immense saver of labour is patent to every one who has seen a row of men supposed to be spreading dung, but who are generally resting their backs by leaning on the tops of their dung-forks, like Jacob on his staff.\*

#### WAGGONS.

Perhaps the clumsiest and least improved implement in use in England is the four-wheeled waggon or wain. Personally I am unable to understand why farmers continue to use it, as to me the trials of the Royal Agricultural Society of England conducted in 1874 are conclusive that the one-horse cart is much superior in every respect. If it can be shown that a four-wheeler is desirable for long journeys on good roads, where one man can bring a two-ton load on one vehicle with his two horses, then the lorry is immensely superior, and a modification of this—a lorry with sides—would be a great improvement on the lumbering waggon which many farmers continue to use not only on the road but even on the farm at ordinary field work. In America the two-horse waggon is in almost universal use, but it is a very different sort of waggon from the English one. Everything is lighter and smaller, while it can either be used as a box-cart or as a harvest one by fitting on a large frame. In winter the wheels are taken off and sleigh-runners fitted on for travelling on the frozen snow. It is fitted with a pole and whipple-trees in the usual way.

I am not prepared to say that an American waggon is suitable for work in this country exactly as it is used on the other side, because, among other things, the wheels are usually too narrow for use on soft ground, and the whole turn-out is intended for work with the ordinary light American horses. On the other hand, they are never used on anything but the soft earthen trails and roadways where Macadam is unknown, and have to be handled somehow when the mud and the slush are about in the springtime and the snow is melting.

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\* Since this was written there has been a successful trial of a dung-spreader in Essex.

## HORSE POWER.

The method of employing horse-power in this country—for driving stationary machinery, such as thrashing machines—is almost universally that of the horse-gear or gin, where the horse walks round in a circle attached to the end of a pole, which turns a geared wheel with it as it goes round. In America the almost universal method used is that of the revolving platform. The principle is very much that of the treadmill where the platform revolves, and the horse keeps his position by continually walking up-hill. The whole arrangement does not occupy any more room than an ordinary cart, is mounted on road wheels, and so is exceedingly portable. Moreover, I have seen figures given somewhere to show that this is the kind of motor by which a horse (or any other animal) will exert the most power with the greatest ease to itself. Of course it is only available for comparatively small sets of machinery, where two horses at most are sufficient; at any rate I have never seen anything larger than a two-horse set, and a one-horse set is more common for such jobs as churning, sawing, pumping, chaff-cutting, and so on. I know of at least one in use in this country, but I am not aware that any maker has taken to manufacturing them here. At the Paris Exhibition there were several exhibited where the thrashing machine and the motor were combined on the one frame (on four wheels), so that the whole thing could be conveniently drawn about—a very suitable arrangement for large farms or where a farmer wanted to have his own small portable set.

## WINDMILLS.

The number of windmills used about farms for pumping purposes is greatly on the increase, and a large number of English makers are now turning them out. The old-fashioned windmills, at which in former years all the corn was ground, still continue to be a feature of the landscape in many districts, though many of them are now in ruins. But the small iron-vaned circular “wheel” windmills, fitted up on a column made of strutted and braced steel rods, is being increasingly used for pumping water, and even for grinding and chaff-cutting. Though many of these windmills are now made at home, it was from the other side of the water that the pattern came. Almost every farm in the States and Canada is provided with one for pumping purposes—not excepting the eastern region, where the hilly and rainy nature of the country provides plenty of gravitation water—while on the prairie these windmills are the most conspicuous features of the farms. One form of these I would

call attention to, as I have never seen it in England. This has its vanes formed after the pattern of the blades of the propeller of a steamship. A little reflection will show that the type of propeller which is best for cutting through the water—that is, *driving* the water back—should also be best for the vanes which are *driven* by the wind. Each vane is rounded off in a peculiar curve, while the side is hollowed out with the concave to the wind. This is designed to absorb the maximum energy from the wind with the minimum of friction and back-suction.

#### CONCLUSION.

I am of course well aware that a large proportion of American implements are too slim and easily broken for use in this country just as they stand—for the crops, the climate, and the soil there are different to what we are accustomed to here—but that does not alter the fact that the *principles* of these implements are capable of adoption in this country, and often even the very implements themselves with very slight modifications. The use of those described above, and others, enables American farmers to handle their soils and their produce with an exceedingly small number of hands, and at the same time to pay a high rate of wages to the men. The scarcity of labour has sharpened their wits over there, and made them invent all sorts of appliances, and although some of them have of course been adopted in this country, a large number of them appear to be absolutely unknown. It cost me in round figures 100*l.* to introduce the “sweep-rake,” illustrated at the beginning of this article, and a combined corn-drill and manure distributor—which is not perfect yet—cost me 100*l.* more; but I am not able to spend any more money to introduce any others, especially as I am not a manufacturer who can take up the making of machines. All the implements herein described, which have not already been introduced, and many others I have not mentioned, could be made practical successes here at a cost of 1,000*l.*, while the gain to the farmers of the country would be immense, the work being done more effectively and at a reduced cost.

Our home implements were originally designed before the age of iron came in, when everything was made of thick solid wood, to suit work before roads were introduced and before land was drained. Now that we can work with lighter and “smarter” types, the old style lingers on, although wood has been superseded by iron and iron has given way to steel, and notwithstanding the facts that a tube is stronger than a solid iron rod, and that a light piece of steel work properly braced

and strutted is stronger than a heavy piece of cast iron. The Americans know all these things and embody them in their products, and some, though by no means all, of our home makers are doing likewise.

Farmers are waking up: and this will soon result—it is doing so already—in a demand for combined labour-saving implements of a lighter and handier sort than those we have had to put up with in the past.

It is much easier for a manufacturer to bring out a new type of machine or to take a Yankee implement and adapt it to our British farming, than for a farmer to do so. Many of the implements I have described are absolutely unknown to the great mass of farmers in this country, and until our makers and agents introduce them they are likely to remain unknown. The average farmer is not an inventor, and does not at once see the value of a new implement—more especially if it is very light in construction—but he is rapidly improving in this respect, and if this article does something to convince him that he who seeks can find, it will not have been written in vain.

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### III.—*South Devon Cattle*. By ALFRED MICHELMORE.

#### HISTORICAL.

THE Reverend John Prince, in his "Worthies of Devon," written many years ago, speaks of "South Devons" or "South Hams," as they were then called, as being different from any other cattle found in England. That they were evolved by judicious crossing there can be no doubt, and it is generally supposed that the Guernsey and the North Devon breeds were originally responsible for their production. Certain, however, it is, that they have existed as an entirely distinct race for a great many years.

Charles Vancouver, in his "Agriculture of the County of Devon," published in 1808, says: "A cow, which was one of the South Hams breed, yielded twenty-four quarts of milk per day, and from which was gathered two pounds and a half of butter;" and again, "A South Hams cow of Mr. Fabian's, after her third calf, fed entirely on grass, yielded twenty-two quarts of milk daily, and from which forty-four ounces of butter were made."

In the early part of the last century South Hams were largely kept for draught purposes. It was then a common sight

to see a team of six oxen yoked to the plough, and this custom continued until the sixties, when beef and milk were more esteemed. By this time the large, yellow, big-boned animal had by degrees given way to the somewhat darker orange or light red of to-day; a process probably accomplished by interbreeding and the careful crossing of different strains. And South Devon can now boast of a perfectly distinct type of animal, embodying the beef-producing qualities of the Devon and the milking properties of the Guernsey.

#### EXTENSION OF THE BREED.

The breed up to recent years remained in unenviable obscurity, having been until the seventies but little known outside its natural habitat, which may be said to extend from Plymouth on the west to Newton Abbot on the east, and from the edge of Dartmoor to the south coast, an area perhaps of some 600 square miles. The Show Ring has since then done much to bring it before the public, and it has gradually extended throughout Cornwall and through parts of North and East Devon, whilst there have been large consignments to South Africa, South America, and the United States. As an instance of the esteem in which it is now held, one of our best known breeders writes me as follows: "I have just had three gentlemen here from Natal, and they say these South Devons are far and away the best cattle imported, and thousands will be wanted."

The South Devon will thrive on the same pastures as the Hereford and the Sussex, and, whilst in no way wishing to detract from the merits of these excellent breeds, I claim, that as South Devons become better known, they will find their way into the Midlands, where, as in their native county, they will do their duty in the dairy and not disgrace the grazier.

#### CHARACTERISTICS.

The characteristics of the South Devon may be summed up as follows: Symmetrical in shape, of a rich light red, hammer-marked on side and flank, lighter in colour under the belly, often running to a patch of white in front of the udder; features broad with a long face and white nose; curved horns of waxy white, of medium length; short neck with a level top and underline, failing perhaps somewhat behind the shoulder, but good in rib and round; tail set square and dropping well over the rounds; the udder full and forward under the belly; teats well apart and of good length, with escutcheon strongly marked from the udder upwards; the carcase rich in lean



**SOUTH DEVON BULL: THREE YEARS OLD.**



**SOUTH DEVON YEARLING BULL.**

flesh and free from patchy fat. A peculiarity of a South Devon is that in feeding it will commence to lay on flesh and fat from the inside, and were it not for the weighbridge it might be supposed that the animal was not doing justice to its food.

#### HERD BOOK.

In 1890 the breed was raised to Herd Book rank, and since then some 1,400 bulls and 4,500 heifers have been entered. An annual sale of pedigree stock is held, at which prices up to forty guineas have been realised for yearling bulls.

#### MILK YIELD.

As already mentioned, the pride of the breeder lies in the double qualification of growing a milk as well as a beef-producing animal. The following figures, as supplied by Mr. R. E. Cocks, of Ranleigh, near Plymouth, show the produce of six of his cows during their last period of lactation:—

"Peeress"	born in 1891,	yielded 1,049	gallons	4½	pints.
"Fidget"	" 1890	" 873	" 7½	" "	
"Miss Jumbo"	" 1891	" 708	" 4½	" "	
"Netton"	" 1892	" 1,180	" 3	" "	
No. 3 Cow	" 1888	" 1,050	" "	" "	
No. 31 Cow	" 1888	" 953	" 6	" "	

or an average yield of 969 gallons per cow.

Mr. J. Sparrow Wroth, of Combe, near Kingsbridge, reports that the yield of Star 5th (962) was measured in 1893, and in 261 days she gave 1,047 gallons of milk, or an average of just over four gallons per day. For a cow in full milk the daily food which is necessarily somewhat varied, consists of from 10 to 12 lbs. in equal proportions of bruised oats, wheat, and decorated cotton-cake, in addition to hay or grass and roots. No actual record has been kept of the percentage of fats, but Mr. Cocks finds on an average that two gallons of milk will produce 1 lb. of butter.

#### BEEF PRODUCTION.

South Devons may, I think, justly claim a prominent position as a beef-producing race. It has long been the aim of the farmers of the West of England to grow, as a well-known writer put it some few years since, "the greatest amount of good beef in the shortest possible time at the lowest possible cost," and the secret of successful feeding is to keep the animal "doing" from the time it is dropped. It is a common experience

for steers of from twenty months to two years old to turn the scale at 7 cwt., or 56 stone dead weight; but perhaps the most notable instance of early maturity, combined with daily increase, was that of the steer belonging to Mr. J. Sparrow Wroth, of Combe, near Kingsbridge, which, as shown in the tabulated statement on page 40, beat all comers in the Block Test Competition at Smithfield in December, 1894.

The testimony of the London butcher who bought this remarkable animal is quite in keeping with the figures given above. He says: "I was very fond of the ox alive, but did



SOUTH DEVON COW WITH HER CALF.

not consider him handsome, his shoulder-bones being too prominent. The touch was very good, and I was quite taken with the animal as a good butcher's bullock, and should think there is not its equal now dead out of the Show. It is a mass of good meat, not too fat in any part, the briskets being nearly all lean. The kidneys are very handsome, one of the nobs weighing 17 lbs., cut straight across. The depth of lean at quartering place is  $4\frac{1}{2}$  inches, covered by  $\frac{3}{4}$  of an inch of fat, and the hind-quarter chine, with nice proportion of fat, is fully  $7\frac{1}{2}$  inches. The carcase of beef is very handsome, the meat excellent, and, I must say, I consider it the best butcher's ox I

BLOCK TEST COMPETITION FOR STEERS NOT EXCEEDING TWO YEARS OF AGE.

Name of Owner.	Breed of Cattle.	Age in Days.	Live Weight.	Average daily gain of Live Weight.	Weight of Dressed Carcase.		Average daily gain of Carcase.		Value at 4½d. per lb.	
					lbs.	lbs.	lbs.	lbs.	£	s. d.
P. Saillard .. ..	Sussex .. ..	652	1,302	1.98	832	1.27	22	14	0	
G. F. Stanford .. ..	Not mentioned ..	670	1,303	1.94	820	1.22	22	4	0	
J. Goodman .. ..	Sussex .. ..	719	1,453	2.02	902	1.37	26	17	0	
H. Longley .. ..	Do. .. ..	717	1,538	2.15	1,016	1.41	27	10	0	
G. Bruce .. ..	Aberdeen Angus ..	665	1,310	1.97	848	1.30	23	10	0	
Major Irwin .. ..	Do. .. ..	667	1,239	1.86	784	1.17	21	5	0	
G. S. Grant .. ..	Do. .. ..	642	1,368	2.13	880	1.37	23	17	0	
G. S. Grant .. ..	Do. .. ..	626	1,358	2.20	882	1.43	23	18	0	
G. A. Ross .. ..	Crossbred .. ..	627	1,283	2.06	750	1.19	20	7	0	
D. C. Bruce .. ..	Do. .. ..	683	1,304	1.96	864	1.29	23	6	0	
D. C. Bruce .. ..	Do. .. ..	665	1,250	1.83	736	1.10	19	18	0	
C. J. Bruce .. ..	Do. .. ..	717	1,402	1.96	806	1.24	24	6	0	
J. G. McGregor .. ..	Do. .. ..	669	1,327	1.98	881	1.34	23	18	0	
W. Watts .. ..	Do. .. ..	658	1,304	2.12	896	1.35	24	6	0	
J. S. Wroth .. ..	South Devon .. ..	663	1,893	2.74	1,190	1.78	32	4	0	

ever killed out of the Show, although I have been a purchaser nearly every year for the last forty years."

As an instance of weight combined with quality, Mr. Coaker, of Old Newnham, Plympton, in 1871, sold four animals to the butcher for 200 guineas, and I could, were it not for the fear of tiring my readers, give innumerable examples of the feeding qualities of the breed.

#### CONCLUSION.

In conclusion, I would recommend intending purchasers of South Devons to visit the annual sale held at Totnes in April, the Agricultural Shows of the county, and the Bath and West and Southern Counties' Meeting at Plymouth in May next.

My thanks are due to the following well known breeders, namely, Messrs. B. W. Coaker, of Old Newnham, Plympton; R. E. Cocks, Ranleigh, near Plymouth; Jno. S. Ford, Yealmp-ton; W. Merry, Woodford, Plympton; W. H. Pain, High House, Kingsbridge; F. W. Rowe, Trevego, Lostwithiel; J. S. Tucker, Pathada, Menheniott; W. P. Vosper, Merafield, Plympton; and J. Sparrow Wroth, Combe, Kingsbridge, for the assistance they have rendered me in compiling this short account of South Devon cattle.

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#### IV.—*The British Congress on Tuberculosis.*

By PROFESSOR SIR GEORGE T. BROWN, C.B.

##### OBJECTS AND SCOPE OF THE CONGRESS.

IN the whole history of sanitary science it would be difficult to find a record of a more important meeting for the consideration of one special disease of the human race than that which, in the short space of a week last July, exhaustively discussed the whole subject of consumption and other forms of tuberculosis in man. Incidentally, the characteristics of the malady in cattle and other animals were considered, but chiefly in reference to the influence which the food products of such animals were likely to exercise on the progress of the disease in man.

The title adopted, British Congress, might possibly suggest a limitation, which, however, did not exist in reality. On the contrary, eminent pathologists and sanitarians from various

parts of the globe were gladly welcomed at the meeting and gave much valuable information. The full report of proceedings, when issued, will show that no phase of the matter was omitted, and it could not be said that any section of the subject failed to receive full and thoughtful consideration.

#### SECTIONS OF THE CONGRESS.

The Congress, for discussion purposes, was divided into the following four sections: 1. The State and Municipal Section dealt with the prevalence of consumption in different parts of the world, statistics, the question of voluntary notification, housing the poor, and the control of the meat and milk supply. 2. The Medical Section was occupied with the diagnosis and treatment of the disease, including the use of the tuberculin test. 3. The Section on Pathology and Bacteriology, among other matters, discussed the variations in the forms of bacilli of tubercle, and the differences observed between the micro-organisms in tuberculosis in man and cattle. 4. The Veterinary Section. As President, the proceedings of this section necessarily occupied the writer's chief attention. The audience included a large number of representatives of the dairy and meat interests, in addition to the members of the veterinary profession from various countries. The President, in opening the proceedings, assured those who had suffered from the irregular methods of meat inspection and from that interference with their trade which dairymen especially complained of, that he sympathised with them, and could only urge greater efforts towards getting the recommendations of the last Royal Commission on tuberculosis of farm animals put into practice. Up to the present time the recommendations published in the Report of 1898 had not received much attention. At the subsequent meetings it was satisfactory to note that those representatives of the dairy and meat interests who took part in the discussions during the week strongly urged the necessity of adopting measures for checking the spreading of tuberculosis and the sale of unwholesome food, while, at the same time, they deprecated the injustice of destroying a whole carcase of good meat because a single tuberculous area might be found in one organ.

During the four days of the meeting papers were read and discussed on the following subjects:—1. The Diagnosis of Tuberculosis in Animals during Life, by Professor Dewar, F.R.C.V.S., Tuesday, July 23rd. In this paper certain clinical symptoms were described which an expert, accomplished in the practice of auscultation, might recognise; but the speakers who

followed were mainly in favour of the tuberculin test properly used, and of its being placed under Government control. Frequent inspection of the udders of cows by competent veterinarians was also advocated.

Mr. Ino A. W. Dollar, M.R.C.V.S., opened the discussion on the following day, Wednesday, July 24th, with a paper on Tuberculosis and the Milk Supply. Communication of tubercle to man from cattle was accepted as a fact. Sterilisation of milk was advocated, and the possibility of the eradication of tuberculosis from herds of milch cows was affirmed.

On Thursday, July 25th, Mr. James King, Chief Veterinary Inspector to the City of London, read a valuable paper on Tuberculosis and the Meat Supply. Mr. King's practice in the inspection of meat was on the lines recommended by the last Royal Commission, but he pointed out the not infrequent hardship inflicted on the purchaser of a fat beast, healthy in appearance, which proved, on being slaughtered, to be so badly affected that it was necessary to destroy the whole carcase.

Professor McEachran, F.R.C.V.S., of Montreal, Canada, read on Friday, July 26th, a very suggestive paper on "Legislation for the Control and Eradication of Tuberculosis in Animals." He advocated the diffusion of popular knowledge among agriculturists and the dairying community of the means by which tuberculosis is spread. Whilst admitting the importance of an open-air life for cattle, he referred to instances of ranch cattle, right away in the western parts of Canada, suffering from tuberculosis, and he recorded a similar experience from New Zealand. There have been many instances in our own country of the disease spreading among herds which lived habitually in the open air, and were only brought in for milking.

Among the distinguished foreign veterinarians who took part in the discussions were M. Nocard, Dr. Schütz, of Berlin, Dr. Malm (Sweden), Professor Bang (Copenhagen), Professor Thomassen (Utrecht).

An analysis of the discussions which took place during the four days of the sittings of the Veterinary Section would show that there was a preponderance of opinion in favour of (a) the tuberculin test rightly carried into effect and properly controlled; (b) the slaughter of all animals showing clinical symptoms of tuberculosis, especially disease of the udder, and of all cattle in the advanced stages of the disease, known as "wasters"; and (c) the regulation by the State of the use of tuberculin. In this connection it may be mentioned that many "wasters," i.e. emaciated subjects, being victims to parasitic gastritis, are perfectly free from any trace of tubercle, but are useless for any purpose, and their slaughter is in any case advisable.

Any attempt to deal with tuberculosis as cattle plague was treated is out of the question; but the suggestion that cows in an advanced stage of tuberculosis with disease of udder, lungs, and intestines, indicated by decided clinical symptoms, should be slaughtered by the authorities, is a reasonable one, and deserves serious consideration, as an easy and economical means of eliminating the worst and most dangerous cases of the disease.

#### DR. KOCH'S ADDRESS.

That Dr. Koch's address would be the event of the Congress was the general anticipation, and it is probable that of the large audience that listened to his address not one left the hall without admitting that the anticipation had been fully realised. The Professor began by referring to the serious character of consumption in all countries and the importance of adopting every possible means to lessen its ravages and, in the end, to extinguish it altogether. He mentioned other diseases which had been checked by the adoption of sanitary measures. Beginning with bubonic plague, he pointed out how at the present day our knowledge of this disease enable restrictions to be applied which formerly were never thought of. Plague, he went on to say, was directly transmitted by patients suffering from plague pneumonia, those escaping this form of the disease being perfectly harmless. The real transmitters, in the majority of cases, were the rats, and there was no doubt whatever that in a large number of instances the plague had, in consequence of its prevailing among the ship rats, been transmitted by ocean traffic.

With regard to cholera, he observed that under certain conditions it might be transmitted directly from one human being to another, but that the main and most dangerous agent in its propagation was water.

Hydrophobia he referred to as a serious malady, which had been stamped out by protective inoculation of all persons bitten, and by the adoption of a compulsory system of muzzling dogs.

Leprosy, Dr. Koch noticed as a disease which, in regard to its cause, was closely akin to tuberculosis, being an affection which depended upon the presence of a parasite greatly resembling the tubercle bacillus. Like tuberculosis, the disease did not break out until some time had elapsed after infection; indeed, its course is sometimes slower than the other disease. It was transmitted from person to person, but only when they come into close contact; consequently the strict separation of lepers from other people was the method by which the

disease was to be checked in its progress and ultimately got rid of.

As to the means of extinguishing infectious diseases, the speaker asked whether, with regard to tuberculosis of the human being, what had hitherto been done, and what was about to be done, really struck at the root of the evil so that it must sooner or later die? How did infection take place? By the inhalation of tubercle bacilli was the answer. As to the source of the bacilli, Dr. Koch entertained no doubt that the latter was derived from the sputum of consumptive persons, who, in coughing and even in speaking, may distribute the germs. The sputum of consumptive persons falling on the ground might be dried and pulverised, and in this state inhaled in the form of dust and taken into the lungs.

The next inquiry was whether there were other sources of infection. Hereditary transmission of consumption was accepted as a rare accident. The tuberculosis of poultry being so distinct from that disease in man, was at once dismissed as unworthy of consideration. In fact, bovine tuberculosis was the only form of the disease in animals which deserved consideration as a possible source of infection to man. With regard to the identity of human and bovine tuberculosis, Dr. Koch affirmed that, in his first publication on the causes of the disease, he expressed himself with reserve. His recent experiments had, however, convinced him that the two maladies were not the same, and he claimed that the results at which he arrived from experiments on cattle, swine, and other animals, were supported by those of such investigators as Chauveau, Günther, Harms, Bollinger, and others. Considering all these facts, he added: "I feel justified in maintaining that human tuberculosis differs from bovine and cannot be transmitted to cattle." Assuming this to be true, is the converse true? If man cannot infect cattle with tubercle, can cattle infect man with that disease by means of either milk or meat derived from tuberculous subjects?

This important question of the susceptibility of man to bovine tuberculosis, Dr. Koch admitted, could not receive a direct answer because experimental investigation with human beings was out of the question. His argument, however, was based upon his observation of the progress of the disease in man, and he remarked that in all great cities large quantities of milk and butter were consumed which must of necessity contain tubercle bacilli in a living condition, consequently, a large number of consumers must habitually take into their system tubercle bacilli. That these bacilli did not produce the disease in them was a conclusion which he bases on the observations he had made, which lead him to infer that an inevitable result

of the ingestion of infective matter must be primary ulceration in the intestinal membrane, a condition extremely rare in the human subject. In fact, he stated positively that among the many cases of tuberculosis examined after death, he himself only remembered having seen primary tuberculosis of the intestines on two occasions. On this evidence the Professor based the opinion that, if man was occasionally susceptible to infection by the milk and flesh of tuberculous cattle, "the extent of infection is hardly greater than that of hereditary transmission, and he therefore does not deem it advisable to take any measures against it." This expression has been generally condemned as uncalled for, and looking at it after a lapse of time, it is very difficult to understand why Dr. Koch thought fit to make it. He admitted that there was a certain degree of danger in taking infected flesh and milk; but that it was so slight that he did not deem it advisable even to take any measures against it. These are the exact words which he used, and they appeared to be very much stronger than the occasion seemed to warrant.

The remainder of the address dealt exclusively with tuberculosis in the human subject, and, as a matter of course, a number of valuable suggestions were made in reference to the adoption of those preventive measures which promise to be most successful. On these points, however, it is not necessary to proceed farther, as the prevention of consumption in man does not bear directly upon that portion of the subject which most concerns the agriculturist. It is necessary, however, to make a few observations upon the general question as to the degree of danger to man from tubercle in cattle.

The two most important points which deserve the consideration of the agriculturist are, first, the alleged insusceptibility of cattle to human tuberculosis, and, next, the insusceptibility of man to bovine tuberculosis.

The first point may be dismissed with very little notice. It has never been believed, and certainly has never been affirmed, by members of the veterinary profession, that any notable degree of tuberculosis in cattle was, or is, derived from a human source. The objection to a consumptive person as an attendant in a cowshed has usually been based upon the fact that such a person would be likely to contaminate the milk of the animals, rather than the animals themselves, and if it had been suggested a few years ago that a consumptive man was likely to infect the cows which he had to milk and attend to, the idea would have been ridiculed.

The second point, however, is open to a great deal of consideration. If it were really true, that is, if it were to be

demonstrated that the disease in cattle was not transmissible to man, or transmissible only to so slight an extent that the danger might be compared to the insignificant risk of hereditary transmission, it would certainly be, indeed has already been, objected that there could be no longer any necessity for stringent regulations in regard to meat or milk, and the cowkeeper and dairyman, as well as the meat-trader, would, with some show of reason, demand to be relieved from a number of very onerous restrictions which not uncommonly interfere seriously with their trade. But such a stage in the inquiry has not yet been, and probably never will be, reached, and even granting that the risk incurred by the human subject drinking milk or eating meat derived from tuberculous animals is extremely slight, there does not appear to be good ground for the conclusion that therefore restrictions are not advisable. On the contrary, as it is impossible to determine who may be a susceptible victim to suffer from the consumption of meat or milk taken from diseased animals, it is certainly desirable, if not absolutely essential, that some precautions should be taken to get rid of even this slight risk, and it is quite certain that the public are now too well educated in a knowledge of the nature of the disease to accept tuberculous products for their daily food without very strong remonstrance. The dairyman and the meat-trader may therefore reconcile themselves to the fact that they will not be allowed to escape the adoption of certain precautions so long as the disease exists among food animals. The necessity of such restrictions was affirmed by some of our best known and most distinguished agriculturists at the Congress, but always with the very important qualification that restrictive measures should be enforced with wise discrimination.

#### ACTION OF LOCAL AUTHORITIES.

The last Royal Commission on Tuberculosis commented in their Report on the very unsatisfactory state of meat inspection in many parts of the country, affirming that chaos was the only word which expressed the existing state of confusion, and they urged the appointment wherever possible of competent veterinary surgeons as meat inspectors, in order to get rid of this condition of things. They also noted that the risk of infection by meat was comparatively slight, as compared with the danger incurred among children by the drinking of milk from tuberculous cows, especially those having tuberculous disease of the udder. Here again, however, recent inquiries have proved that considerable difficulties may arise in reference to the evidence which shall be accepted as proof that milk

is contaminated with tuberculous matter. Detection of the characteristic bacillus has hitherto been taken as conclusive, but it is well known that there are a number of other bacilli, some very closely resembling in form the tubercle bacillus, and all of them resisting the action of acid after being stained in the ordinary way. It is not too much to say that the diagnosis becomes extremely difficult, and it may be positively asserted that the fact of any one observer finding organisms which he considers to be tubercle bacilli in a certain specimen of milk is not sufficient evidence to justify the stoppage of a dairyman's trade until careful inquiry has been made as to the state of the cows from which the milk was obtained.

The difficulties attending the identification of tubercle bacilli from others closely allied to them, are commented on in an article in the *Lancet* of September 28th last, by Dr. Lydia Rabinowitsch, and readers of that article will probably be disposed to accept the conclusions of the writer that the only certain way of differentiating tubercle bacilli in milk is by the intraperitoneal injection into guinea-pigs of a mixture of the cream and sediment of thoroughly centrifused milk.

After this strong statement from an accomplished bacteriologist, amateurs and even fairly experienced bacteriologists must hesitate before they condemn a specimen of milk without knowing something of the condition of the animal from which it was taken. Some of the specimens of acid-resisting bacilli so closely resemble the bacilli of tubercle found in milk and butter, as well as in a number of other products, that the appearance presented by these organisms under the microscope may mislead the observer if he rests entirely upon such evidence. This remark, however, must be taken in connection with the fact, which it is necessary to emphasise strongly, namely, that milk from an udder in any condition of disease, whether the disease is contagious or not being a matter of comparative unimportance, is not fit for human consumption. Ordinary pus from an abscess in the mammary gland is not a desirable addition to milk, and coming in contact with an abrasion in the mouth of the person drinking it, might cause even more injury than the tubercle bacillus itself. Milkers even in the best establishments cannot be trusted to detect, or, if they detect, to report cases of so-called "garget" inflammation in one or more quarters of the mammary gland, and they may continue to draw from the diseased quarter as long as it will yield milk or any other fluid.

These remarks are made not as speculative expressions of opinion, but are based on facts which have frequently come under the writer's observation.

CAN TUBERCULOSIS BE GOT RID OF AS OTHER CONTAGIOUS DISEASES  
OF ANIMALS HAVE BEEN?

Dr. Koch, in asking the above question in reference to tuberculosis of the human subject, observed that there were many who doubted the possibility of successfully combating a disease which had existed for thousands of years and had spread all over the world. "This is by no means my opinion," he adds. "On the contrary, we may enter upon the conflict with a surely founded prospect of success." Basing this hopeful view on the general results which have attended the efforts to stamp out animal plagues, Dr. Koch goes on to say: "It is necessary first and foremost to inquire how infection takes place in tuberculosis." And he showed by reference to recorded facts that the infection of human consumption was distributed chiefly by the sputum of the consumptive patient (which in advanced stages of the disease almost always contains tubercle bacilli); "sometimes in incredible quantities. By coughing, and even speaking, they may be flung into the air in a moist condition, and can at once infect persons who happen to be near the cougher." "The sputum may also be pulverised when dried on the linen and on the floor, for instance, and get into the air in the form of dust."

It is observed invariably in regard to animal plagues, that the transmission of disease takes place from animal to animal. Cattle-plague from cattle to cattle, sheep-pox from sheep to sheep, swine-fever from swine to swine, and so on. Certain exceptional instances are noticed; sheep and goats may get cattle-plague. Foot-and-mouth disease has rather a wide range of affinities; but the law is, or rather the rule is, with a very few exceptions, that the animal which has a disease conveys it to other animals of the same class.

Having ascertained the source of infection, the next thing is to prevent healthy subjects which may be near at hand coming in contact with the infective matter. This applies with equal certainty to diseases of the lower animals, and if Dr. Koch can hold a very hopeful view in reference to the stamping out of consumption in human beings, notwithstanding that the disease is spread over the whole world, surely the stock-owner need not despair of success from a well-directed effort to check the progress of tuberculosis in cattle.

Dr. Koch does not suggest the stamping out system, as it is employed in the case of cattle-plague or pleuro-pneumonia, but he does in principle exactly the same thing. Slaughter of animals whose lives are only valuable in comparison with so

much coin of the realm may be defended on the ground that it is the most perfect method of completely destroying infective matter and preventing its further manufacture by the diseased animal. By adopting this course all trouble in watching the further progress of the disease in the infected subjects is avoided ; but the same result (as has been proved in reference to foot-and-mouth disease), in many instances, can be attained by a rigid system of isolation, which, though involving more trouble than slaughter, when properly carried out is equally effective. By this method, therefore, the stock-owner may do a great deal for himself in the direction of getting rid of tuberculosis without any assistance from the Government. In fact, if his intentions were firmly directed towards the attainment of the desirable result, he might do without Government aid much better than he could do with it ; having the animals under his own observation, being his own policeman, and having the greatest possible interest in obtaining a successful result, he would certainly be in advance of any conceivable method of official interference. The disease is one which does not lend itself at all to the ordinary method of stamping out. Wholesale slaughter would cost an enormous sum, and even then a large number of cattle must necessarily be left with the disease in a form which, although not readily detectable, is, nevertheless, capable of being conveyed from one animal to another.

Dr. Bang has shown, and his observations were supported by high authorities who spoke during the Congress, that the disease can be got rid of by the judicious employment, first as a means of diagnosis, of the tuberculin test, properly used by competent veterinary surgeons observing all the essential conditions. Above all things, they must ascertain that the animals to which the test is to be applied are in a perfectly healthy state ; a fact which can be arrived at easily enough by adopting a system of observation for some days before the test is applied. The temperature should be taken morning and evening, and the result of continued observation will show whether the cattle are in a fit state to be operated on, or whether it is desirable that they should be kept under observation for a longer time. Then would follow strict isolation, regular injections of tuberculin and other details of Dr. Bang's very successful system. With observation applied in this way, with the stock-owner himself looking on as a keenly interested observer, the results would be much more reliable than they would be under occasional superintendence of an official inspector, whose time would be too much occupied to allow him to devote himself to one particular herd. Pedigree cattle would be too valuable to be prepared for the butcher, nor would it be necessary, as, under

the system which Dr. Bang has recommended, all the valuable animals which re-act would be removed from those which have not re-acted, and it would be quite possible still to use them safely for breeding purposes, as he has proved to demonstration.

Further, there is good reason to expect that by a regular employment of tuberculin the disease may be, if not absolutely eliminated, at any rate so far diminished that it would be a matter of comparatively trifling importance.

Strict sanitation in the cow-shed would, as a matter of course, have to be enforced as part of any preventive measures. An open-air life for cattle, wherever it is possible to provide it, is most important. Perfect cleanliness, sufficient ventilation, even to the extent of keeping the animals cooler than is considered desirable for the purpose of obtaining a large supply of milk, and all other sanitary measures, are matters of detail which could easily be carried into effect if there were a firm determination to get rid of the disease. There would be no difficulty in formulating the precise system to be carried out; but this would be a disheartening task unless a general intention to extinguish the disease existed, and all owners of infected animals were ready to co-operate in endeavouring to eliminate from their herds a malady which, if it cannot be compared with cattle-plague in its rapid destruction of animal life, is in some respects worse than that disease, because of its insidious character, which prevents it from being brought prominently under notice. An outbreak of cattle-plague would excite alarm and lead to decisive action, at whatever cost, with the knowledge that, if the disease were allowed to spread unchecked, it would, it is true, die out at last, but in the act of so dying would carry off a very large proportion of stock of the country. Nothing of this sort is to be apprehended with tuberculosis; but it nevertheless does a considerable amount of mischief, and by its continued presence leads to the adoption of severe restrictions affecting the farmers' trade, the milk trade, and the meat trade, restrictions which might gradually be either dispensed with, or materially modified, if it were seen that all possible precautions were being taken by the stock-owners themselves for the purpose of checking the ravages of the malady.

In concluding this paper, it may be permissible—paraphrasing Dr. Koch's observations in reference to tuberculosis of the human subject—to say that although there are many who doubt the possibility of successfully combating this disease in cattle, which has existed for a great many years and is spread widely over the world, that is by no means my opinion.

This is a conflict into which we may enter with a prospect of success, as surely, if not more surely, founded than is the expressed hope of finally extinguishing tuberculosis in the human subject.

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V.—*Some Lessons of the Weigh-Bridge.* By J. COOKE HURLE.

FROM the spring of 1897 I have grazed cattle for sale to the butcher and have weighed them at short intervals for the purpose of ascertaining what progress they were making and what conditions of food and shelter gave the best results. The cattle, which, unless otherwise stated, were ordinary steers of the Shorthorn class, were always weighed unfasted, and, after 1897, at the same hour, about ten o'clock in the morning; if weighed at any other hour, the time will be noted in this article. The weigh-bridge was tested and stamped by the Inspector of Weights and Measures for the County of Somerset.

It is of very great importance that steers should be weighed under the same conditions on each occasion. One instance as to this will suffice. In the spring of 1898 six steers were being fattened in a yard in which the pond had become foul from the droppings of the cattle, and they preferred the water in a larger pond in the outer yard into which they were turned every morning while the sheds in the inner yard were being cleaned out. One morning I weighed the cattle at 8.30 before they drank from the larger pond, and again at 10 after they had had access to it. I found at 10 o'clock that the weight of one of the steers was unaltered, but that the others had increased by amounts of 10 lbs., 21 lbs., 21 lbs., 40 lbs., and 45 lbs. respectively.

Again, beasts differ in their progress so greatly, even when kept under the same conditions of food, that the plan which is sometimes adopted of feeding three or four beasts on one kind of cake, and three or four on another kind, and then comparing their progress, is one which requires frequent repetition before the results can be accepted as conclusive. For instance, in 1898, three well-bred Shorthorn steers, all healthy, purchased from the same farm, kept together all the time and treated alike, gained between April 20th and October 3rd, 265 lbs., 395 lbs. and 427 lbs. respectively, while seventeen other steers, also kept together and treated alike all the time, showed considerable differences between May 10th and September 8th, four of them in that period gaining from 223 lbs. to 253 lbs., five from 263 lbs. to 297 lbs., four from 309 lbs. to 316 lbs., and

four from 324 lbs. to 341 lbs. I could give a large number of similar instances; and they appear to me to show that the average results of a number afford safer ground for drawing deductions than is supplied by the progress of individual cattle.

In this article I propose to give the evidence of the weigh-bridge on the following points:—

1. The progress of stores in winter.
2. The best time for putting grazing cattle on fresh grass in the spring.
3. The advisability of giving cake during the flush of the grass.
4. The most profitable time to place steers in the yard in autumn.
5. The merits of various foods.
6. Shelter in winter for fattening steers.
7. The progress of the best steers.

#### 1. THE PROGRESS OF STORES IN WINTER.

On November 4th, 1897, fifteen Irish heifers were bought in Bristol Market. They were purchased five or six shillings cheaper per cwt. of live weight than they would have cost in the following April. Three of them proved to be in-calf, and the weights of these are therefore left out of consideration. The other twelve averaged on the following morning 6 cwt. 2 qrs. 14 lbs., and on December 2nd, 7 cwt. 14 lbs.—probably a return to their normal weight before their voyage from Ireland. Between December 2nd and February 5th (65 days) they gained on the average 25 lbs. each; between February 5th and March 25th (48 days) there was on the average neither gain nor loss; between March 25th and May 12th (48 days) there was an average gain of 24 lbs. each. They were in the open all the time, receiving as much poor hay as they could eat.

Twenty-one steers in poor condition, weighing on January 15th, 1898, on an average 7 cwt. 2 qrs. 14 lbs. each, increased under similar conditions 15 lbs. only on the average between that date and March 25th (69 days), and a further 21 lbs. each by April 20th, from which day hay was discontinued and they received daily just under 3½ lbs. of cake and maize-meal mixed. Under this stimulus they gained on the average 6½ lbs. each in the next 20 days.

In 1901 six steers were similarly treated, and increased only 41 lbs. apiece between January 25th and April 12th (77 days).

## 2. THE BEST TIME FOR PUTTING GRAZING CATTLE ON FRESH GRASS IN THE SPRING.

My weigh-bridge was not erected till early in May, 1897, and I can therefore give no figures for this spring.

In the spring of 1898 thirteen steers in fair condition were kept on bare grass with hay and 4 lbs. decorticated cake daily from March 25th; on this they made fair progress till they were turned into strong young grass on April 21st; hay was still given, but cake was discontinued till the 28th and then resumed; between the 20th and 27th they lost on the average 7 lbs. each, and then began to gain again, but not very rapidly before May 9th. Nine other steers, however, which had not been receiving cake, placed with the above, gained 8 lbs. apiece between the 20th and 27th, while the twenty-one steers mentioned above did well with cake on moderate grass from April 20th.

In 1899 all steers were kept in the yard till May 1st, receiving no cake or meal. Fourteen were then turned out and given 3 lbs. undecorticated cake daily. These gained 11 lbs. apiece by May 9th, and then progressed at the rate of 3 lbs. daily.

In 1900 I kept steers on bare grass with hay and chaff till May 5th, and they did remarkably well when turned into strong grass without cake on that day.

In 1901 I again put out steers on strong grass in April, and received an instructive lesson. Seven good Shorthorn bullocks, averaging on March 26th 8 cwt. 3 qrs. 8 lbs., were on bare grass with poor hay till April 27th. Between March 26th and April 12th they lost 11 lbs. apiece. I then gave them chaff in addition, and 4 lbs. maize-meal daily per bullock; between April 12th and April 25th they increased on the average 45 lbs. each. On April 27th they were put on strong young grass, so much to their liking that they refused hay. They were given, to prevent scouring, chaff and 4 lbs. undecorticated cotton-cake each daily; but in the twelve days between April 25th and May 7th they only increased 8 lbs. apiece, as against 45 lbs. in the thirteen days prior to April 25th. On May 7th cake and chaff were discontinued, and by the 13th they had gained on the average 7 lbs. more. They were then placed with nine other steers on  $7\frac{1}{2}$  acres of untouched grass, and these seven steers gained between them just  $5\frac{1}{2}$  cwt. by May 25th (7.37 lbs. apiece daily for twelve days). Six other worse bred Shorthorns were with them all the time, and their progress was almost precisely similar except for the last mentioned period, when their average daily gain was 5 lbs.

After carefully noting all the evidence that the weigh-bridge affords, it appears to me to be a mistake to put steers on strong fresh grass in April. It pays better to keep them on bare grass with some hay till early in May. Not only is the strong April grass generally deleterious to the cattle, but it is evident that when grass is growing rapidly, the bulk will be enormously increased if the grass is left untouched for two or three weeks.

### 3. THE ADVISABILITY OF GIVING CAKE DURING THE FLUSH OF THE GRASS.

In order to consider this point, I will take the grazing seasons of 1898, 1899, 1900, and 1901. I cannot take 1897, for in that summer our cattle suffered greatly from warble flies, and the result was that the steers made very little progress indeed during the time of the attacks of the flies, from the middle of June till the end of July. I communicated with the late Miss Ormerod, who most kindly sent me a copy of her pamphlet on the Warble Fly; and in subsequent years the warble grubs were extracted from the backs of the steers in May, and stray flies from neighbouring lands were kept off by using the smears recommended in that pamphlet.

In 1898 the average amount of cake and meal given to each steer in the period of four months, from May 9th to September 8th (122 days), was 632 lbs., and the average gain in live weight was 299 lbs. Forty-one steers were kept during this period, and cake was given all the time.

In 1899 thirty-one steers were kept through the summer, and cake was given throughout, but in less quantity. I do not, however, compare (for this purpose) their weights after August 26th, when the scarcity of grass, owing to the drought, necessitated the giving of hay; for when hay is commenced, there is always a rapid increase for about a fortnight in live weight. But up to August 26th, while receiving 141 lbs. less of cake and meal than the steers of 1898, their average gain was 267 lbs. against 266 lbs. in the previous year. Both 1898 and 1899 were dry summers; the latter was described by the Agricultural Correspondent of the *Times* on September 25th, 1899, as, "with the exception of the summers of 1864 and 1868, the hottest and the driest of the last sixty years."

In 1900 I determined to try the effect of giving no cake or meal as long as the cattle did not seriously suffer, and accordingly none was used till August 7th. From that date up to September 5th, 116 lbs. were consumed by each steer, and the total average increase in live weight from May 5th to September 5th of the fifteen steers kept on the farm during that period was

349 lbs. Five of the steers, however, were Herefords or crosses between Herefords and Shorthorns, and these made an average gain of 401 lbs., the other ten averaging 323 lbs.; which was 24 lbs. better than the steers of 1898. I should mention that the Herefords were, with one exception, three years old, and in poorer condition than most of the others of their year, but not in worse condition than half the steers of 1898.

In 1901 I intended to follow the same treatment as in 1900, but the drought obliged me to give cake from June 20th to July 2nd, and to commence it permanently on July 10th. I was also obliged to give hay from August 28th. From May 7th to August 27th, 243 lbs. cake and meal were consumed as against 402 lbs. (May 9th to August 26th) in the very similar year of 1899, and the average gain in live weight of the fourteen steers grazed for that period was 239 lbs.; that is, although there were three extra days, 28 lbs. worse than 1899. No doubt it would have paid better in that year to have given cake after the middle of June in much larger quantities.

It will be interesting to note the average daily gain in these years during the flush of the grass:—

Period.*	Daily Gain.
1898—May 9th and 10th to June 17th and 23rd ..	3·61 lbs.
1899—May 9th to June 24th .. .. .	3·15 "
1900—May 5th to June 22nd and 25th .. .. .	4·61 "
" " the Herefords) .. .. .	4·19 "
1901—May 7th to June 19th .. .. .	3·26 "

In 1898 an average of  $4\frac{1}{2}$  lbs. of cake and meal was given daily, and in 1899 an average of  $2\frac{3}{4}$  lbs. In 1900 and 1901 no cake or meal was consumed. In the summers of 1898 and 1900, especially the latter, grass was abundant; in the summers of 1899 and 1901 it was not; and this should be taken into account in comparing the daily gains.

There was an article some years ago, I think, in the Journal of the Royal Agricultural Society, in which the writer stated that his cattle made equal progress in May and June whether cake was given or not. And the late Mr. Sutton demonstrated that grass at this time of year contains a very much larger proportion of albuminoids than at any other period. The capacity of a steer is limited; and if cake is consumed, it must follow that less grass can be eaten.

\* When two days are given, the steers were in separate lots, and the lots were weighed on different days. In 1898 the steers were weighed at 2 P.M. on May 9th. In 1900 the steers were weighed at 8 A.M. on May 5th, at noon on June 22nd, and at 11 A.M. on June 25th; with steers at grass the difference between the weights at these hours and at 10 A.M. would probably be immaterial.

Taking the weigh-bridge test alone, it would appear worse than useless to give cake in ordinary years in May and June, but from another point of view it may be desirable to do so. Prices generally rule higher about Midsummer than at any other period of the year, and in 1898 I sent two steers to the butcher at the end of June, and five more at the end of July or beginning of August, out of a total of forty-nine steers. In 1899 I was able to sell five steers fat at the end of July out of a total of thirty-five steers. In 1900 and 1901 I had no steers ripe enough to sell at that time of year.

Thus the result of giving cake during the flush of the grass is apparently to turn the energies of the steer to ripeness rather than to growth; and it may, for reasons of price, be profitable to give cake to a fleshy steer at this period, although the actual gain on the weigh-bridge may be diminished by doing so.

#### **4. THE MOST PROFITABLE TIME TO PLACE STEERS IN THE YARD IN AUTUMN.**

This must depend largely on the season, but to judge the right time is a matter of some moment. A steer in a yard in the earlier autumn months will consume much more hay than if it is left on the grass, while, on the other hand, it will make no progress at all if left out too late. The following records will show the comparative results of taking stock in altogether, of taking them in at night only, and of leaving them out in the open.

In 1897 two steers were put in the yard on September 13th, and another on October 5th. Twelve others, of equal or better quality and of an average weight of 11 cwt. 1 qr. 10 lbs., were kept on the grass till November 18th. The average gain of the three from September 6th to December 15th was 229 lbs. (2·29 lbs. daily) against 218 lbs. (2·18 lbs. daily), the average gain of the twelve kept on grass for the same period. Both lots received similar amounts of cake and meal.

In the following year only a few of the worst steers were kept at this period. All that were fit to go were sold by auction early in October.

In 1899 the average gain of nine steers, from September 12th to December 9th, was 201½ lbs., being 2·29 lbs. daily. They were taken into the yard on November 8th, but allowed out in an adjoining field for a few hours every day in good weather for the ensuing four weeks.

In 1900 the steers did exceptionally well. Not only was the grass in the summer very nutritious, but the hay made was of excellent quality. In that year the steers were taken in

at night much earlier. I commenced to do so on October 4th, omitting, however, the three nights October 8th to 11th, and they were allowed out in the daytime till November 28th. Twelve steers, averaging 11 cwt. 3 qrs. 15 lbs. on September 5th, made by December 8th—six days shorter than 1897—an average gain of 235 lbs., or 2·5 lbs. daily; the Herefords, curiously, increasing at nearly the same average rate, viz., 237 lbs. Sixteen steers left out in the open for this period increased 200 lbs. (2·13 lbs. daily); but these steers were much less ripe than those in the yard, and would naturally therefore, if they had been under the same conditions, have increased at a faster rate than riper steers. Their average weight on September 5th was 10 cwt. 1 qr., and they received about two-thirds of the amount of cake and meal given to the twelve.

It will be desirable to examine the amounts of artificial food given at this period.

1897.—The twelve steers above mentioned were receiving on September 6th 4 lbs. decorticated and undecorticated cake daily, which was increased on September 27th to 4½ lbs. In October, cake averaged exactly 6 lbs. daily, almost entirely undecorticated cotton and linseed. In November, 9 lbs. daily, chiefly linseed-cake and maize-meal, were given, and to December 15th, 13½ lbs. daily. The total cake consumed per steer in the 100 days was 246 lbs. linseed, 126 lbs. decorticated, 144 lbs. undecorticated, and 235 lbs. meal; total, 751 lbs., averaging 7·51 lbs. daily. Sliced swedes were given from November 18th, about 47 lbs. daily to each steer.

1899.—The steers were not as good in quality as those of 1897 or 1900. The average amount of cake, &c., given was 7·8 lbs. daily.

1900.—The twelve steers, which averaged on September 5th 61 lbs. heavier than the steers of 1897, were receiving on that day 3 lbs. decorticated cake and 3 lbs. maize-meal. On the 14th undecorticated cake was substituted for the decorticated, and on the 17th I added 2 lbs. decorticated, making 8 lbs. daily for the rest of the month. In October, 10½ lbs. of cake and meal were given daily. In November, 12½ lbs.; and to December 8th, 15½ lbs. The total quantity of cake consumed in the ninety-four days was 50 lbs. linseed, 245 lbs. decorticated, 107 lbs. undecorticated, and 576 lbs. meal. Total, 978 lbs., averaging 10·4 lbs. daily. No swedes were given. These steers did not when killed turn out as well as the steers of 1897.

1901.—Steers were not kept after September.

## 5. THE MERITS OF VARIOUS FOODS.

In comparing the merits of foods, the weigh-bridge does not in one respect give a clear answer. A food may promote growth, and maize-meal is undoubtedly a food of this character; but the effect of it, as shown by the weigh-bridge, is exaggerated, for it also promotes thirst, and (as I have shown already) water weighs well. On the other hand, a food, such as linseed-cake or decorticated cake, may produce a considerable increase in carcase weight without a corresponding increase in live weight. I will give an instance from the winter of 1898-99. Three steers were weighed on October 13th and tied up on October 15th and 20th; their condition was such that it would be fair (judging from two or three healthy but immature steers which I have at different times sent to the butcher) to take their then carcase weight at 55 lbs. per cwt. of the unfasted live weight. Their live weight averaged 11 cwt. 9 lbs., and on this basis their carcase weight might be fairly assumed at 5 cwt. 1 qr. 21½ lbs. They were sent to the butcher on January 24th,\* and their actual average carcase weight was returned by him at 6 cwt. 3 qrs. 9 lbs. This showed an increase in carcase weight of 155 lbs., while the live weight had only increased by 84 lbs. In the same winter four steers were placed loose in the yard on October 15th. Their average weight on October 13th was 11 cwt. 1 qr. 15 lbs., and estimating their carcase weight on the same basis as the others, they would then have weighed 5 cwt. 2 qrs. 10 lbs. They were sent to the butcher on December 28th,† and their carcase weight averaged 6 cwt. 3 qrs. 6 lbs., showing an increase of 136 lbs. in carcase weight, while the bridge showed an increase of 138 lbs. in live weight. These steers received considerably more cake than meal.

Barley-meal was tried in the summer of 1899 for some time, but appeared to give less satisfactory results than maize-meal; and this accords with the respective values of these foods, as shown in any work on agricultural chemistry.

The decorticated cotton-cake used in 1897 was American, but in subsequent years the best English—a soft cake, much liked by the steers—was used, and gave (so far as I could judge) more satisfactory results than linseed-cake.

Undecorticated cake was used occasionally as an astringent to prevent scouring.

In the spring of 1898 mangolds were given or withheld

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\* Weighed unfasted on the bridge at 8 A.M.; but I made no note as to whether they drank before weighing.

† Weighed unfasted on the bridge at 8 A.M.; but I made no note as to whether they drank before weighing.

from fattening steers for periods varying from a week upwards, and the steers appeared to make quite as good progress without them as with them.

#### 6. SHELTER IN WINTER FOR FATTENING STEERS.

Inasmuch as every pound of live weight is worth about 3½d., it is evident, I think, that, if pecuniary loss is to be avoided when keeping grazing stock during the winter, shelter is indispensable.

After the middle of December half-fat steers in the open will go back, even if supplied with plenty of hay and cake. In the winter of 1897-98 eleven steers of this description were in the open, receiving just under 6 lbs. daily of cake or of cake and maize-meal mixed. From October 5th to November 20th (46 days) they increased on the average 97 lbs., being 2·11 lbs. a day. On the 20th November they averaged 11 cwt. 3 lbs., and their average gain by December 16th was 7 lbs.; but by January 14th this was lost, and they weighed almost the same as on November 20th. Six of them had gained a total of 127 lbs., and five of them had lost 119 lbs. On January 14th one was tied up, and on January 18th the other ten were brought into a yard with ample shedding round it. The effect of shelter was apparent at once, for though the cake and meal were very slightly increased, to an average of 7 lbs. daily for each steer, seven of them gained by March 11th (52 days from January 18th) a total of 7 cwt. and 2 lbs., being an average increase in live weight of 2·16 lbs. daily. Three of the others (including the tied-up steer) were killed before that date, their average daily gain being also 2·16 lbs., and the remaining one was not weighed on March 11th; but when killed on March 17th, it was found that he had done nearly but not quite as well as the average of the others.

The case of four steers who had been running all the summer without cake, and were bought early in November and placed with the preceding steers is instructive. Their condition was poorer, and the novelty of the cake acted as a stimulus. Between November 20th and January 14th, while the others were stationary, they gained an average of 44 lbs. each (but all before December 27th), and also gained more rapidly than the others when taken into the yard, viz., at the rate of 3 lbs. daily.

#### 7. THE PROGRESS OF THE BEST STEERS.

A few records of individual steers may be of interest. A steer bought on May 17th, 1900, then weighed 7 cwt. 1 qr.

4 lbs. On September 11th, just before hay was commenced, it had reached 10 cwt. 1 qr. On December 12th,\* when it was put in the yard, it weighed 12 cwt. 23 lbs., and on April 3rd, 14 cwt. 1 qr. 13 lbs. On that day it was turned out, as it had nearly killed a smaller steer, and by May 7th it had dropped back to 13 cwt. 1 qr. 24 lbs. It was sold on September 9th,† then weighing 16 cwt. and 3 lbs. The gain was 979 lbs. in 480 days.

But steers kept a shorter time greatly exceeded this rate of increase. In 1897 a steer, though suffering from warble flies in June and July, increased from 10 cwt. 3 qrs. on May 29th, to 15 cwt. 3 qrs. and 21 lbs. on January 13th, the increase being 581 lbs. in 229 days. In 1898, six steers (out of forty-seven) increased 4 cwt. and upwards between April 20th and October 3rd (166 days), the best of them putting on 532 lbs. In 1899, a steer increased from 7 cwt. 3 qrs. 7 lbs. to 12 cwt. 3 qrs. 10 lbs. between May 9th and December 9th, 563 lbs. in 214 days. But the year 1900 supplied a record. Fifteen steers were bought on April 19th,‡ and on October 19th they had increased from 122 cwt. 2 qrs. 17 lbs. to 190 cwt. 3 qrs. 23 lbs., being an average increase of 510 lbs. in 183 days, the best of them during this period gaining 655 lbs. This was a steer with a considerable strain of Hereford blood; but for the entire period during which I kept them—viz., from April 19th to December 8th—it was beaten by a Hereford, which increased from 9 cwt. 3 qrs. to 16 cwt. 3 qrs. 17 lbs., a gain of 801 lbs. in 233 days. Both these steers were in extremely poor condition when bought; they had been wintered on a bleak farm in the open, and fed almost entirely on barley-straw.

## VI.—*English Wheats*, 1875-1901. By W. R. MALLETT.

In turning over the pages of an old copy of one of our reliable Trade Papers, I find the following sentence in the market report under date June 7, 1875 :—"American wheat being weight for weight dearer than English of the same quality, meets with

\* Weighed at 4 P.M. On Dec. 8th he weighed at 10 A.M. (the usual hour) 12 cwt. 1 qr. 7 lbs.

† Weighed at 11.30 A.M.; but on grass the difference would not be important.

‡ Seven of them weighed at 4 P.M.; remainder, including both the best, at 10 A.M.

very few purchasers." In the same issue is given the following comparative values :—

Kent or Essex white wheat, 42*s.* to 46*s.* per quarter.

American No. 1 spring—old, 44*s.* to 46*s.* „

„ „ „ new, 42*s.* to 44*s.* „

Californian, 43*s.* to 45*s.* per quarter.

Odessa Ghirka, 41*s.* to 43*s.* „

It is instructive to compare these values with those now ruling for the same kinds, when it will be seen that a serious change has occurred in the relative values of home-grown and foreign wheats. The last splendid harvest has brought the values of English and foreign wheat closer together than for the last three years, but this season I have had no difficulty in getting a full supply of the finest white wheats procurable in the western district at 28*s.* per quarter, and have to pay a price equal to 32*s.* per quarter delivered for the No. 1 American spring wheat of to-day, certainly of no better quality than that obtainable in 1875.

This may be attributed in some degree to the demand of the public in our large towns for a larger, lighter, and what is known as a "stronger" loaf; but it is also due to a deterioration in the milling value of native wheats.

Let me illustrate this in another way. Thirty years ago it was the custom to make flour suitable to the public taste, that would give satisfaction to the consumers both in town and country, by an admixture of 75 per cent. of home-grown wheats with 25 per cent. of foreign. Indeed, after an ordinarily favourable harvest some large country mills, favourably situated in good wheat districts, would grind 80 per cent., or even 100 per cent., of native grain. Fifteen years ago the proportion of foreign wheat that a miller would be compelled to use, had increased to one-half, whilst to-day, even with the excellent condition of last year's crop, it is not safe to make flour to meet the general demand from a mixture containing more than 20 to 25 per cent. of English wheat such as is now usually grown, and I know of large mills whose owners would be glad to use all the English wheats they could, where even this small proportion has had to be reduced to 15 per cent.

Why is this? Surely an explanation must be forthcoming, or the diminution of the acreage of home-grown wheats, with all the consequent evils, will become year by year more marked.

Agriculturists are not, in my opinion, alive to the essential quality of "strength" in their wheat; a point that all who work inland mills, and who are naturally buyers of the bulk of English wheat, have long been driven to consider.

Strength is determined by the presence in wheat of what is known as gluten, and that of the right kind; experiments, therefore, must be directed towards increasing this constituent and to tracing its origin, determining to what extent its presence is attributable to the original seed, how far it is the product of climatic surroundings, to what extent it depends on the nature of the soil, or can be produced and fed by manures. These points can only be settled by long-continued and careful experiments.

Two years ago some interesting questions were sent out by Mr. Rush, of "Beerbohm's List," based upon a resolution passed, on the proposition of the writer, at a Council Meeting of the National Association of British and Irish Millers, asking country millers throughout the kingdom what kind of wheat was usually grown in their district, and what proportion they could use for flour. Eighty per cent. of the replies received complained of the lack of strength, some emphatically describing the wheat brought to them as "poor weak stuff," others stating that they had to supplement it by the addition of foreign flour (a process, by the way, which has been the favourite sheet anchor of the perplexed country miller). Briefly, all were unanimous in their complaints of the quality on account of its weakness.

These reports came from men whose profits in trading depended to a very large extent on the efficient home supply of good wheat, and who had no predilection, but absolutely the reverse, in favour of foreign wheat.

I should like to dispel an impression prevailing in some quarters, that the introduction of the modern system of milling by rollers has militated against the value of English wheat. Such an idea is entirely wrong; rollers will grind anything that is brought to them equally with the old millstone, and without this modern system there would be no market for home wheats at all, and no milling in England.

I will now endeavour to trace the causes of this deterioration in quality and value of English wheat.

Ten years or so ago, when the decline in the value of wheat was becoming serious, the attention of seed-growers was directed to the production of a wheat that would give a larger yield with more valuable straw, and thus help to compensate for the loss in price. They succeeded in this, but, unfortunately, they lost sight of the fact that the wheat so produced, whilst productive and large-berried, was "starchy" and weak, resulting in the advantages gained on the one hand being almost lost on the other, and this is the primary cause of the situation to-day.

I do not wish to blame these gentlemen, nor the growers,

for, until the last year or two, but few protests had been made by the milling trade against it; in fact, only recently an experimenter, whose researches in the hybridisation of cereals are of great value, admitted to the writer that his principal efforts had been directed to produce a grain that would fill the bushel, quite irrespective of its milling or trade value, of which he had heard but little.

Now the one essential of wheat production is that it should pay, and it is idle to attempt to supplant these better yielding wheats except with a substitute that will give equal yield, straw value, constitution, and weather-resisting properties.

Can this be done? In February, 1900, in an address to the Farmers' Club, Mr. Garton, of Warrington, speaking of a new kind of wheat which his firm then had under treatment, said, that "when a sufficient stock warrants its introduction, the British farmer will be placed in possession of a wheat equal or superior to any grown in any part of the world."

In later communications with Messrs. Garton, I was glad to note that they were cognisant of the drawbacks in many of the existing breeds of wheat, and had for some time turned their investigations in the right direction, viz., the production of "strength."

As I believe that the present situation is largely due to a conviction entertained by many of the scientists, specialists, and seed-growers throughout the country, that a big, bold, "peck-filling" grain is the one thing to aim at, I am optimistic enough to refuse to admit as impossible the production of a breed of wheat, which, whilst retaining the advantages of yield and straw value enjoyed by inferior qualities, will yet regain the lost but necessary attribute of "strength."

The National Association of Millers have now taken definite action by passing the following resolution at their Council Meeting of October 30th:—

"That having regard to the importance of an increase in the growth and use for flour making of English wheat, a systematic inquiry into the questions bearing upon its quality, aiming at an improvement in its milling value without sacrifice in yield of wheat and straw is desirable. That this Association is willing to co-operate on such lines with the South Eastern College and any other persons and authorities deemed desirable. That a small Committee be appointed to represent the Association in the matter, and that this Committee be empowered to expend, if need be, an amount not exceeding 50*l.*

The committee consisted of Mr. Wilson Marriage, of Colchester, Mr. Humphries, of Weybridge, and myself.

The work of experimental investigation has been already begun, plots of about 3 acres each have been sown with different kinds of wheat in Essex, Kent, and Surrey, in the Fen and Warp districts of Cambridge and Ely. We have been greatly indebted to Professor Hall, of Wye College, to Dr. Somerville and Mr. Biffen, of Cambridge—who have not only planted some plots in their respective districts, but have undertaken to record the rainfall and watch over the peculiarities of growth in each case—and also to Dr. Goodfellow, the experienced analytical chemist to the London Master Bakers' Society, who will, later on, supervise the bakery tests necessary to complete the investigation thoroughly.

The writer has reasons for believing that the Board of Agriculture looks with favour on the movement, and will be prepared to render substantial help.

It is hardly necessary to point out the great interest and practical importance of the subject to the mass of British agriculturists, and the field opened up for careful scientific investigation and experiment. It is much to be hoped that not only Agricultural Societies, but also individual farmers, will watch with careful attention experiments which may tend to help stem the tide now so strongly setting in against English wheat growing, and will co-operate in an endeavour to make the production of English wheat satisfactory and profitable to all concerned.

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## VII.—*Basic Superphosphate: Its Composition and Use as a Manure.* By JOHN HUGHES, F.I.C.

THE success attending the application of basic slag (Thomas phosphate powder) on certain kinds of soil has practically demonstrated the superior manurial value of an alkaline phosphate which only slowly and very partially becomes soluble in water, as compared with the ordinary acid superphosphate, in which the phosphoric acid is immediately and completely soluble. It occurred, therefore, to the writer that if the alkalinity of basic slag could be combined with the well-known superior solubility of superphosphate, the resulting product would possess a higher fertilising value than either slag or superphosphate alone.

After numerous experiments, a manure possessing an alkaline character, and, at the same time, great solubility, was pre-

pared by the careful admixture, in suitable proportions, of slaked or partially slaked lime with ordinary acid superphosphate.

The manure so prepared is known as basic superphosphate, and has a distinctly alkaline character. This may readily be ascertained by placing a small quantity in a vessel containing water, and testing the solution with a slip of red litmus paper, which will rapidly become blue.

The special solubility of the manure may be tested by placing 1 part in 1,000 parts of cold distilled water in which 1 part of crystallised citric acid has been previously dissolved, and allowing the solution to stand 24 hours with occasional stirring. At the end of that time, or sooner, if the powder has been finely ground, 92 to 94 per cent. of the whole manure will have been dissolved in this very weak solution of a vegetable acid, while the insoluble portion, when filtered off and burned, will not amount to more than 6 to 8 per cent.

In this solution will be found the whole of the free phosphoric acid and monocalcic phosphate which existed in the original superphosphate in a form completely and readily soluble in water, and commercially known as "soluble phosphate."

The mechanical condition of the new manure is superior to that of both basic slag and superphosphate, for, being in a fine dry powder, it is admirably adapted for uniform distribution either by hand or machine. Its light as well as bulky character, as compared with basic slag, may be conveniently illustrated by placing equal weights in two glass tubes about 1 foot long, when it will be seen that basic superphosphate occupies a space of 11 inches, as compared with only  $4\frac{1}{2}$  inches occupied by basic slag, the relation in round numbers being as 100 to 40. Compared with superphosphate, the material is very much drier, containing only 4 to 5 per cent. of moisture, instead of the 14 to 18 per cent. usually found in commercial superphosphate.

Farmers will at once appreciate these mechanical advantages, and will understand that there can be no danger of any clogging of the drill from damp condition, nor, on the other hand, of the manure falling between the fingers before complete delivery can be effected, which, on account of the heavy and gritty nature of the powder, is a common complaint against slag.

#### COMPOSITION OF BASIC SUPERPHOSPHATE.

The following analysis represents the average composition of several samples manufactured during the past season :—

Moisture (lost at 212° F.) .. .. .	4·46
Combined water and loss on ignition .. .. .	8·86
*Phosphoric acid .. .. .	14·65
Lime .. .. .	37·06
Sulphuric acid.. .. .	29·75
Oxides of Iron, Alumina, Magnesia, etc. .. .. .	2·07
Insoluble matters .. .. .	3·15
	<hr/>
	100·00
	<hr/>
*Equal to Phosphate of lime .. .. .	31·98

# RELATIVE SOLUBILITY IN COLD WATER.

The following tabulated results will show the readiness with which the manure can be dissolved by exhaustion (1) in cold water alone, and (2) in a very weak cold solution of citric acid (1 in 1,000), which, for reasons to be afterwards explained, has been chosen as the analytical standard solvent.

For the purpose of comparison a good basic slag, which, by previous analysis, was found to contain 38·97 per cent. of phosphate of lime, and to show 83·88 fine powder, was similarly treated.

One gramme of each manure was dissolved, with occasional stirring, in 1 litre (1,000 grammes) of cold distilled water, when the clear portion, after being in contact for 48 hours, was filtered off and analysed.

	Basic Super-phosphate.	Basic Slag.
*Portion soluble .. .. .	66·80	6·60
Portion insoluble (after burning) .. .. .	33·20	93·40
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Containing—		
Soluble lime .. .. .	22·28	4·70
No phosphate soluble in water in either manure.		

These results demonstrate that in perfectly cold water basic superphosphate is ten times more soluble than slag, and 22·28 per cent. of lime is dissolved in one case, as against only 4·70 in the other.

These figures may perhaps explain why basic slag fails on certain soils, while it produces excellent results upon others. Ordinary water has evidently little action upon basic slag, and only water impregnated with vegetable acids is capable of dissolving a hard fused substance like slag, however finely it

may be ground. In other words, it is only on sour acid soils that much benefit may be expected from slag.

It will be noted that no phosphate of lime was extracted from either manure, because the alkaline nature of the materials, caused by the presence of lime, retained all the phosphoric acid in a precipitated form in the case of basic superphosphate, and in an even more insoluble form in that of slag.

#### SOLUBILITY IN CITRIC ACID. (1 IN 1,000.)

The effect of the weak solution of citric acid, selected as a standard solvent, is fully illustrated by the analyses of three samples of basic super. manufactured in England, Ireland, and Scotland during the past season.

The results of a similar analysis of the basic slag used in the previous water exhaustion experiment is appended for comparison :—

1 grm. manure.  
1 grm. citric acid.  
1,000 c.c. cold distilled water.

This, having been allowed to stand 24 hours, with occasional stirring, was then filtered, the insoluble portion being burned and weighed, and the clear solution analysed with the following results :—

	Basic Superphosphate.			Basic Slag.
	1	2	3	4
*Portion soluble in cold weak citric acid solution .. .. }	94·60	93·00	92·60	38·80
Portion insoluble after ignition	5·40	7·00	7·40	61·20
	100·00	100·00	100·00	100·00
*Containing—				
Soluble lime .. .. .	36·73	33·53	29·56	22·17
Soluble phosphoric acid ..	13·35	12·00	12·45	8·70
Equal to phosphate of lime	29·14	26·19	27·18	18·99

It will be noticed that only 38·80 per cent. of the slag was dissolved, against, respectively, 92·60, 93, and 94·60 per cent. in the case of basic super. Also, that only 18·99 phosphate of lime, out of a total of 38·97, was dissolved from the slag, against 26·19, 27·18, and 29·14 from the basic superphosphate out of 28·64, 28·20, and 30·60 total phosphates present.

It should always be remembered that it is not the total quantity of phosphate of lime contained in a sample of slag that should be considered in forming an estimate of its agricultural value as a manure, but rather the extent to which such phosphate of lime may or may not exist in a form likely to be readily available as plant food.

When exhausted with the above-mentioned weak solution, containing 1 part of citric acid in 1,000 parts of cold distilled water, it was found that only 18·99 per cent., or less than half of the total, 38·97 phosphate of lime, was dissolved. Consequently the actual percentage of phosphate of lime contained in the slag is not, and cannot be, a correct indication of its probable agricultural value.

#### COMPARISON OF SOLUBILITY.

In order to compare the relative solubility of different manures, it is necessary to employ very weak solutions, as may readily be gathered from the following tabulated results.

1 gramme of each manure was treated with—

200 c.c. of 1·0	per cent. solution of citric acid.				
400 c.c. of ·5	"	"	"	"	"
1,000 c.c. of ·1	"	"	"	"	"
2,000 c.c. of ·05	"	"	"	"	"

Having been allowed to stand for 24 hours, with occasional stirring, the insoluble portion was filtered off and weighed after ignition, with the following result:—

		Basic Super-phosphate.	Basic Slag.
Portion soluble in	200 c.c. of 1·0 per cent. .. ..	94·60	61·70
"	" " 400 c.c. of ·5 " .. ..	95·30	54 50
"	" " 1,000 c.c. of ·1 " .. ..	95·70	38·80
"	" " 2,000 c.c. of ·05 " .. ..	92·40	30·30

It will be seen that, while the solubility of the basic super. remained practically constant up to a dilution of 1 part of citric acid in 1,000 parts of cold water, the solubility of the basic slag declined enormously with the increased dilution.

Dr. Sutherst, of the Agricultural College of Holmes Chapel, in his interesting paper on "The Solubility of Phosphatic Manures in Organic Acids" (*Chemical News*, October 25th, 1901), gives the following comparative results.

In each case 1 gramme was treated with 100 c.c. of a cold 1 per cent. solution of acetic, tartaric, and citric acids

respectively, and after remaining in contact 24 hours, with frequent agitation, the clear liquid was filtered off, and the phosphate of lime dissolved out was determined.

	Basic Super-phosphate.	Basic Slag.
Total Phosphate of lime present .. .. .	28·38	29·13
Acetic acid dissolved out .. .. .	18·53	12·30
Tartaric .. .. .	28·37	15·85
Citric .. .. .	24·79	19·64

Even with the stronger and more concentrated solutions, 1 in 100 employed by Dr. Sutherst instead of the weaker and more dilute solution of 1 in 1,000 employed by the present writer, the solubility of the phosphate of lime present in basic super., was in all cases considerably greater than that of the phosphate of lime existing in the slag, this superiority being specially marked in the case of tartaric acid.

#### SELECTION OF THE STANDARD SOLVENT.

It seems reasonable that the solution of some vegetable acid should be employed as a solvent for determining the proportion of available plant food existing in a soil or a manure.

Of the various vegetable and organic acids, citric acid appears to have been the favourite solvent employed by chemists for determining the proportions of a soil, or of a manure that might be regarded as available plant food. But, though the above-named acid was generally selected, the strength of the solutions and the relative proportions of liquid to solid employed varied greatly.

It is not necessary here to refer to the names of the distinguished men who have laboured in this interesting and most useful investigation; but it will be sufficient to mention that Wagner employs the comparatively strong solution of 2 per cent., while Stutger employs a solution of 1 per cent.

Dr. Bernard Dyer has followed the latter, but in adopting a 1 per cent. solution of citric acid as his standard solvent, he acted quite independently, for he states that it was an attempt to imitate in the solvent the acidity of root-sap, based on the acidity of the roots of 100 specimens of flowering plants of twenty natural orders.

The details of these interesting determinations will be found fully set forth in Dr. Dyer's original paper on "The Analytical

Determination of Probably Available Mineral Plant Food in Soils" (Journal of the Chemical Society, March, 1894). There were 103 separate determinations made, and the acidity of the root-sap is stated in terms of crystallised citric acid. On examining these determinations we find that—

27	showed an acidity of over 1 per cent.
49	" " " between .5 and 1 per cent.
27	" " " less than .5 per cent.

Among those showing less than 1 per cent. of acidity are the following important farm crops:—

	Sap acidity of roots.
Wheat (Rivets) .. .. .	.58
Wheat (Red square head) .. .. .	.51
Barley .. .. .	.38
Oats .. .. .	.65
Perennial Rye-grass .. .. .	.35
Italian Rye-grass .. .. .	.63
White Turnip in bulb .. .. .	.51
" " " fine roots .. .. .	.62
Swedes in bulk .. .. .	.37
" " " fine roots .. .. .	.44
Mangold, Orange Tankard in bulb .. .. .	.25
" " " " fine roots .. .. .	.46
Smooth Meadow-grass .. .. .	.41
Sheep Fescue-grass .. .. .	.46
Fox-tail-grass .. .. .	.54
Dog's-tail-grass .. .. .	.52
Sixteen specimens gave an average of .. .. .	.48

The above results show that the standard solvent of 1 per cent. was fully twice as strong as the average acidity of plants which constitute the bulk of our farm crops.

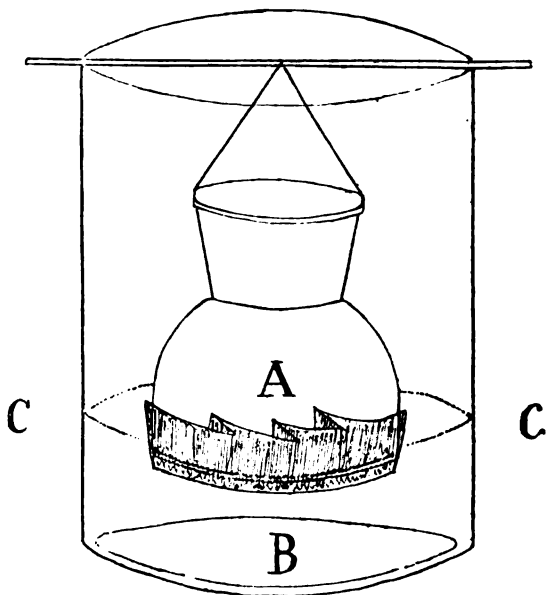
But it is desirable to select as a standard a solution that shall have an acidity which is considerably below, rather than above, the average acidity of such crops.

Recognising the importance of selecting such a standard, the writer has adopted a solution of 0.1 per cent., consisting of 1 part of citric acid dissolved in 1,000 parts of cold distilled water. Such a solution represents an acidity absolutely below that of any of the 103 flowering plants examined by Dr. Dyer. It is therefore contended that any phosphoric acid, lime, or potash, dissolved out by this solution, may fairly be regarded as available plant food.

#### ROOT ACTION ILLUSTRATED BY MEANS OF A DIALYSER.

It is generally recognised that plants derive their mineral food by absorption in a liquid state through their root-hairs,

solid particles, however small, being incapable of passing through the membrane of the hair. The absorption of food is, in fact, a process of dialysis, which may be described as the passage of chemical matter in solution through a membrane, and diffusion into the liquid on the other side of the membrane. The manner in which this process is accomplished may be briefly explained by the following illustration :—



APPARATUS FOR DIALYSING.

The dialyser A consists of a bell-shaped glass vessel, the flat bottom of which is made of a piece of parchment paper carefully arranged, folded over the edges or rim, and securely tied with string. After testing with water to see that the parchment paper is free from holes and perfectly water-tight, citric acid and water, in the proportion of 1 to 500, are placed in A and carefully lowered into the outer glass jar B, into which some basic superphosphate and cold water, in the proportion of 1 to 500, have been previously placed. The dialyser A is so adjusted that the level of the liquid is the same in each vessel, and the apparatus is then put aside and allowed to remain for a week, being very gently rotated each day. Chemical action at once commences, and during the week a portion of the citric acid in A passes down through the membrane into the solution in B, and acts upon the basic superphosphate, dissolving the

phosphate, and, by the law of diffusion, a considerable portion of the dissolved phosphate is carried back through the membrane into the dialyser A. The strength of the solution when it reaches the superphosphate is only 1 in 1,000. The liquid respectively in A and B gave on analysis the following results:—

	A In solution above membrane.	B In solution below membrane.	C Insoluble below membrane.
Phosphoric acid .. ..	4·48	6·40	3·27
Lime .. .. .	15·36	17·73	3 86

Had a longer time been allowed, a still greater portion of the basic superphosphate would have been dissolved; but at the end of only one week, out of a total of 14·15 phosphoric acid, 10·88 had been dissolved, and, of this, 4·48 had been actually carried through the membrane into A by absorption.

In the case of the lime, out of a total of 36·95 there had been dissolved 33·09, of which 15·36 had been carried through the membrane into A by absorption.

These results demonstrate, in a simple manner, the action of root-hairs, which really may be regarded as minute dialysers, containing an acid sap capable of dissolving mineral plant food which exists in the soil, and with which the hairs are naturally in contact.

In considering the above illustration the action between the root-hairs and the soil, it must be remembered that this dialytic action can only proceed when there is a sufficient supply of moisture on both sides of the cell walls of the root-hairs, which in the dialyser are represented by the membrane. Hence, during a drought, as the soil becomes dried up, the diffusion of root sap is checked, and the plant suffers from want of nourishment.

#### BASIC SUPER. AS A MANURE.

Basic superphosphate is not intended to supersede either well made superphosphate as a manure for good arable land containing plenty of lime, or well ground slag, as a manure for damp sour grass. It is intended rather to occupy a medium position between these two manures, and to be specially applicable to soils naturally deficient in lime, such as granite, clay, sandy and peaty soils, the combined area of which represents a large proportion of the cultivated acreage of the United Kingdom.

The trials already made during the past year have fully demonstrated that, on soils containing less than 1 per cent. of lime, basic superphosphate, instead of ordinary superphosphate, can be applied with very considerable advantage.

On soils subject to the disease known as "Finger and Toe," it may with confidence be used as a dressing for turnips, because phosphate of lime, so necessary to the production of good root crops, is best applied on such land in an alkaline rather than an acid form.

It is of course not contended that basic superphosphate is, or can be, in itself under ordinary circumstances a cure for the disease referred to, but it is the best form in which to apply phosphates in such cases, and this has been supported by results actually obtained.

Soils where "Finger and Toe" prevails are usually deficient not only in lime but also in potash, so that a dressing of 1 cwt. per acre of sulphate of potash, or 4 cwt. of kainit salts, should be applied before attempting to grow turnips or swedes. In addition to its use for spring sown crops the new manure may be applied as an autumn dressing on clover seeds, trifolium, lucerne, winter beans and pastures generally.

Basic superphosphate has a distinct alkaline character, and in this respect resembles farm-yard manure, which is always alkaline; indeed, the fertilising value of dung depends upon the extent to which the original nitrogen compounds are, under the influence of proper fermentation, converted into ammonia salts. The application of acid manures must be regarded as quite abnormal and *unnatural*, and the only reason why acid superphosphate has been beneficial to crops grown on good arable soils is that the acidity of the superphosphate has been absorbed or neutralised by the abundance of lime present in such soils.

The late Dr. Augustus Voelcker as long ago as 1863, writing in the Journal of the Royal Agricultural Society, stated:—

"No acid combination as such can enter into plants without doing them serious damage, even free vegetable acids, such as humic and ulmic acids, are injurious to all crops cultivated for food for the use of man or beast.

"Free mineral acids are, I believe, still more injurious to all farm crops than the free organic acids that are found in humus.

"A very dilute solution of sulphuric acid (say 1 part in 1,000 of water) may be used with advantage for killing grass in gravel walks; but if the walks are made with limestone gravel the application of a much stronger acid has little or no effect on the grass or weeds, because the acid unites with the lime forming gypsum.

"The more rapidly and completely the soluble phosphate in commercial superphosphate and turnip manures is precipitated and rendered insoluble in the soil, the more energetic its effect will be upon the turnip crop."

The necessity of relying upon a sufficiency of lime in the soil is entirely removed when using basic super., as, by the careful admixture of an excess of slaked lime in its manufacture, all acidity is destroyed, and the manure may be applied without danger even in direct contact with the seed sown.

Instead of going to the expense of liming a field so thoroughly that every square inch shall contain sufficient lime to neutralise the acid contained in a subsequent dressing of superphosphate, the use of basic super. will enable the farmer to apply phosphates in conjunction with lime at the same time. In addition to supplying phosphates in a readily available form and in an alkaline condition, the excess of lime will promote bacterial life, resulting in the nitrification of any accumulated nitrogenous matter of the soil that may be in the immediate vicinity of the basic super., so that the root-hairs of the plant will obtain a supply of nitrogen as well as phosphates for absorption.

Prior to the invention of basic super., it was always considered undesirable to add lime in a caustic state to superphosphate, because the addition of such lime reduced the percentage of soluble phosphate upon which alone the agricultural value of the manure was supposed to depend.

The researches of distinguished chemists show that the value of phosphatic dressings does not depend on such solubility in water to the extent formerly believed, and that on all soils deficient in lime it is very desirable that ordinary acid superphosphate should not be applied unless either the soil or the manure has been first treated with the necessary amount of lime.

As already mentioned, it is more economical to add lime in small quantities to the manure rather than in large quantities to the soil. It follows, therefore, that on certain soils basic superphosphate, though costing somewhat more, will, in the end, be more economical than ordinary superphosphate as hitherto applied.

#### PRACTICAL EXPERIMENTS.

The manure has been sold during the last season in 187 places in England, 72 in Scotland, and 13 in Ireland. Many of the deliveries were in quantities of 10 to 30 tons, so that the actual trials must have been more numerous even than these figures suggest.

Notwithstanding the late application of the manure, due to the short time during which it has been on the market and also

to the very dry season, the reports received have been generally satisfactory and most encouraging.

The first experiment made public was conducted by Mr. William E. Bear, of Hailsham, Sussex, and though only on a small scale deserves to be noticed on account of the care with which the comparative trials were carried out, and because the soil had previously been fully analysed by Dr. Dyer, whose results add very much to the value of the experiment. It is unfortunate that such soil analyses are too often omitted in manurial experiments.

DR. DYER'S ANALYSES OF THE SOIL IN WHICH THE RADISHES  
WERE GROWING.

	Top soil.	Sub-soil.
Silicious matter insoluble in strong hydrochloric acid .. .. .	87.260	81.560
Alumina .. .. .	3.260	5.580
Oxide of iron .. .. .	3.477	5.141
Lime .. .. .	.683	.246
Magnesia .. .. .	.260	.200
Potash .. .. .	.179	.285
Soda .. .. .	.082	.121
Phosphoric acid .. .. .	.083	.059
Sulphuric acid .. .. .	.024	.024
* Organic matter, carbonic acid water of combination, etc. .. .. .	4.692	3.784
	100.000	100.000
* Containing nitrogen .. .. .	.141	.048
The potash includes—		
Potash dissolved by a dilute (1 per cent.) solution of citric acid (probably "available" potash) .. .. .	.003	.001
The phosphoric acid includes—		
Phosphoric acid dissolved by a dilute (1 per cent.) solution of citric acid (probably "available" phosphoric acid) .. .. .	.006	.061

Mr. Bear, who has kindly allowed the analyses to be used for the purpose of this paper, in a communication in the "Agricultural Gazette" of July 15th, 1901, headed "An Experiment with Basic Superphosphates," over the letters W. E. B., wrote as follows:—

"Soil from a field somewhat deficient in lime was placed in two 4½-inch flower pots, and in one ½ oz. of basic superphosphate was placed, while an equal quantity of ordinary superphosphate (30 per cent. soluble phosphate guaranteed) was put in the other. On June 8th, thirteen seeds of French breakfast radish were sown in each pot. Nine grew in the basic pot, and seven in the other. From the first the radishes

in the basic pot grew away from the others; and, on being pulled and washed, seven (taken as they came out of the basic pot) weighed  $2\frac{1}{2}$  ozs., tops included, while the seven out of the other pot weighed only  $1\frac{1}{2}$  oz. In each case the scale (a letter-weighter) plumped down well, so that there may have been an eighth of an ounce more of each. However, seven of the radishes grown with basic superphosphate weighed 66 per cent. more than an equal number grown with ordinary superphosphate in the same kind of soil, although the soil and manure of the basic pot had to support two more plants than those of the other pot."

The proportions of manure employed in the above experiments calculated per acre are certainly much more than would be applied in ordinary farming, but as the same quantities of the two manures were used in each case it is evident that basic super. was the more suitable manure for the soil.

The important point to notice in connection with these results is, that the soil represents exactly the description of land upon which the new manure is most likely to produce an improved yield, for it contains considerably less than 1 per cent. of lime, the figures being .683 in the surface and .246 in the sub-soil.

Another satisfactory trial was that made by Mr. Ouston, near Driffield, Yorks, where an excellent crop of turnips was grown on light clay soil, the previous cropping having been seeds, wheat, and barley. The turnips were dressed with farm-yard manure and 5 tons of basic super. to the 28 acres.

At the request of the writer, a sample of the soil was carefully taken for the purpose of analysis with the following results:—

**SOIL FROM MR. OUSTON'S TURNIP FIELD.**

**COMPOSITION IN THE AIR-DRIED CONDITION.**

Water (lost at 212° F.) .. .. .	1.38
Organic matter and combined water .. .. .	3.44
Oxides of iron .. .. .	2.97
Alumina .. .. .	2.41
Lime .. .. .	.78
Magnesia .. .. .	.32
Potash .. .. .	.17
Soda .. .. .	.10
Sulphuric acid .. .. .	.03
Phosphoric acid .. .. .	.18
Carbonic acid .. .. .	.37
Insoluble matters .. .. .	87.85
	<hr/>
	100.00
Containing nitrogen .. .. .	.14

This analysis has been included, because the figures for lime, .78, so closely agree with those in the previous analysis of Mr. Bear's soil. It was not possible to obtain the actual weight per acre of turnips in time for this paper; but, as stated, the crop was an excellent one, which, as the sender of the sample remarked, was quite exceptional in that district on account of the dry summer. Indeed, the drought was responsible for the failure of many trials instituted for the purpose of testing the properties of basic super.

While basic super. is not put forward as a cure for "Finger and Toe," it is contended that it is a more suitable form of applying phosphates to land subject to that disease than ordinary acid superphosphate, and that, in cases where the soil is not very seriously affected, the manure is capable of producing greatly improved results, as is testified by many reports from those who have used it.

The general results of the first year's experience of the use of this manure upon corn and grass were very satisfactory, as shown by many communications from those who had tested it. It seems reasonable, therefore, to believe that basic superphosphate will prove a benefit to farmers throughout the country, and that it is, on account of its alkaline character and its solubility, specially suitable to the large area of cultivated soils naturally deficient in lime.

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#### VIII.—*Small Farming at the Beginning of the Twentieth Century.* By ELDRED G. F. WALKER.

AGRICULTURE at the opening of the twentieth century is admittedly in bad case, and yet the world at large is more dependent than ever upon it. The population of the world increases rapidly and becomes more wasteful of food as it increases. Scarcely any of the older nations can feed themselves, and the uttermost ends of the earth are being brought under contribution to provide food for the teeming millions in our crowded centres of civilisation. Some time or other the harvest of the land, as well as that of the sea, must become less able to bear the strain of increasing demand, and then the food supply of the world will engage such attention as has never before been given to it.

In England farming has seen many changes, from the small to the large, and back again to the small. The present position of the latter type of farming is the subject with which I propose to deal. In considering what constitutes a small

farm, locality and circumstances must be taken into account. A man farming five acres near a large town would be regarded as a small farmer; as would be also one renting one hundred acres on the Cotswolds, where many farms run to a thousand acres each. Yet, if the latter, with his one hundred acres, were transferred to the vicinity of a large town, he would be considered a fairly large farmer. Therefore, for the purposes of this article, I shall consider small farms as ranging from five to one hundred acres. Anything up to five acres must be regarded rather as a residential holding than a small farm; whilst market gardens, the very existence of which depends on their proximity to market or rail, must be equally left out of the reckoning.

The great agricultural prosperity of the fifties and sixties of the last century undoubtedly caused the absorption of scores of small holdings by larger ones. The men who farmed the most acres were the first to get rich, and by these a Naboth's vineyard, in the shape of a small holding, was generally obtainable. Land, even if purchased dear, was a gilt-edged security, and therefore money was freely advanced to convert large farms into still larger ones, which could be more economically worked than the smaller. The small holding having been absorbed, the house attached to it was utilised for the labourers, or allowed to tumble down. In the latter case the stones, having been devoted to roadway repair, or otherwise disposed of, are now no more ready to hand for reconstruction purposes. This has had a very important bearing on the small farming of the present time.

In England the average size of our farms may now be taken as being about sixty acres, whilst in Denmark they are about half that size. Germany has its average farms at about one-third, and France one-fourth of the English average. In England, a landowner can purchase as many acres as he likes to perfect the outline of his estate. In Denmark, the law says once a home always a home, and no man can increase his holding beyond a certain limit; this wise provision helps to keep the rural population on the land. In France ten times the quantity of land is farmed by owners than is the case in England, there being over 45 million acres thus farmed in France, and only some 4½ million acres in England. In a Danish homestead we find the occupying owner prosperous, while a French peasant proprietor usually has a marriage *dot* for his daughter and something besides in the bank. Would that this could be said of the small farmer of England! And yet small farming is supposed by some to be the universal panacea for agricultural depression in this country.

But the first question which arises relates to the provision of buildings for these small holdings. Farmers who had outlying portions of land added, at high rentals, to their farms in the old days of prosperity, would most willingly give them up now, and there would be plenty to take them if only the former buildings were on them, but they have been destroyed.

A twenty-acre holding requires something more than a labourer's cottage. The dwelling-house must have decent accommodation for a family, and in these days of dear labour and materials, 400*l.* will scarcely provide this. In addition, there must be some permanent outbuildings, such as stables, cowshed, cartshed and piggery, which, with incidentals, soon absorb another 200*l.* If the twenty acres of land are purchased, say, at 40*l.* per acre, land and buildings will involve an outlay of some 1,400*l.* A 5 per cent. return on this means a rental of 70*l.* per annum, and rates on this may be put at 5*l.* per annum. Is not this enough to make any cautious man hesitate before he determines to purchase those twenty acres in the hope of obtaining from them a sufficient return to meet the 75*l.* per annum required for rent and rates, the interest upon his capital, and a wages reward for his labour? As landowner, as well as occupier, he cannot reduce the rental, whilst buildings depreciate, gates, &c., require renewal, tithes have to be paid, and then, as likely as not, he becomes crippled, and another year's rent is added to the capitalisation account. Had he allowed his money to remain in stocks or shares he could at any time have easily realised his securities, and meanwhile he would have received his dividend warrants with regularity, and free of trouble. If he has to sell his small holding, he must call in the aid of a lawyer, as well as an auctioneer, and, after allowing for expenses, he may be well satisfied if he gets back four-fifths of his original outlay.

With such prospects as these, is it a matter of wonderment that the present-day landlords do not go in for the provision or multiplication of small holdings? The risk is too great, the return too small. If, however, an owner has a number of small holdings on hand, he would do well to keep them up, as in this case he has not to incur the expense of the initial outlay.

There are two kinds of occupying owners—the one who farms for a hobby, the other from necessity. The former is usually a business man, who has made his “pile” in the city and seeks to end his days in the country. Small hobby farms seldom pay; yet, if the owner does not attempt too much, they afford much pleasure and healthful employment. Consequently, nice, compact, small holdings, suitable for hobby farms, still realise the best values in the open market.

The occupying owner who farms from necessity is an altogether different type. He intends to make his small holding pay, and generally succeeds in doing so. Whatever he expends on his holding is for the benefit of himself, and that is a stay and a support to him. He has, what all farmers should have, security of tenure. He is not content to care for to-day only, but for to-morrow also. His fairly prosperous condition is mainly owing to his having three great advantages. Firstly, he pays no rent; secondly, he has a very small labour bill; and thirdly, by doing the greater portion of the work himself, he knows that it is done as he intended it should be. It is not scamped as in piece work or dawdled over as in day work.

If there is a swampy corner in his five acres, he proceeds to drain it; or a bank of earth may be carted from one field and utilised to fill up several awkward gripes in another. These improvements might never have been carried out had the farmer been a tenant instead of an owner. If he had been an owner and not an occupier, he would probably have demurred to the expense. Gate-posts and rails are not allowed to rot down in order to be renewed by the landlord, but are kept in repair so long as wood and nails will hold together. Buildings are run up, the owner finding the materials and a lot of the labour himself; skilled labour only is paid for when absolutely necessary, all which is vastly different to what it would be were it a landlord's contract matter.

The occupying owner is not always at home; he is a very familiar figure at sales, and, if there is a bargain going, he generally knows something about it. He does not put all his eggs in one basket. His farm is cultivated to the last foot, and two years out of three he has a double crop, though his holding be only twenty acres. On it he grows all varieties of corn, with a fair sprinkling of market-garden crops. His dairy cows are usually well-bred ones, or else deep milkers; his horse is a general purpose one, and his pigs such as a bacon-curer will buy. The quantity of auxiliary foods used on these small holdings is astonishing, and of course the manurial value is in the land, which in consequence improves annually.

His children, although better educated than many others, are expected to work. They do not usually go out to service, for on these small holdings there is not money enough to keep a servant, and the wife and daughters have to do the work themselves.

In all my experience I have never seen one of these occupying owners come to grief, except through some fault of his own. I am alluding to a real owner and not to one with a

mortgage on his holding entailing as much or more interest as would suffice to pay a rent. The small owner with a heavy mortgage has to maintain all the buildings, gates, &c., as though the property were unincumbered, whilst as an owner more is expected of him as regards keeping up his social position than if he were merely a tenant farmer.

To my thinking the worst stage of small farming is that under the conditions of a tenancy. I have no hesitation in saying that at the present time 75 per cent. of the tenants of small holdings are worse off than day labourers. The small tenant farmer is too often one who has failed with a large farm, and out of the wreck has managed to save perhaps a few score pounds. He retires upon one of these so-called small holdings, one-tenth the acreage and one-third the rent of his former farm. After a life of comparative ease on his large farm the new tenant, perhaps somewhat advanced in years, does not take kindly to his changed conditions. Methods of cultivation vary, things which could be easily done with the appliances of the large farm are an impossibility on the smaller one, marketing is different, a 10*l.* horse is far different from a 150 guinea team. Purchasing a single cow with the knowledge that he has only 15*l.* in his pocket is a contrast to the facility with which he formerly wrote a cheque, and then, when he is bound to sell on a bad day to meet his meal bill, his loss is great, and he knows that the profit upon the animal has gone at one fell swoop. In debt here, there, everywhere, he attempts to pay off by driblets. A year's rent behind, his landlord presses him, and he sells to meet the claim. He cannot leave the holding because he is unable to carry with him his floating burden of debts. So long as he remains a customer the miller will supply him if he keeps up his payments as his pigs go out, but let him attempt to leave and the account is presented for prompt settlement. His financial position is a matter of common knowledge, and first one and then another puts cattle into keep, and his crops are sold before they are harvested, whilst he is afraid to spend even a few shillings a week for bare necessities. The farmer who begins in a small way may end in a large, but the farmer who begins large and ends small is in a sad plight.

Another type is the labourer, who has slowly, though surely, made his way up the ladder of life. First of all perhaps he has worked for a farmer, whilst his wife at home ran a sow and a goose or two on the village common, and afterwards a cow; then an acre or two of land was acquired, and a pony came upon the scene, and light hauling and marketing were undertaken. The few pence, then shillings, earned were saved, and gradually grew into pounds, and stock was purchased, necessitating a

larger holding. And this type often grows into one of the successful farmers of to-day.

Now as to the holdings. These are very often owned by some small landowner; perhaps it is a widow's only means of income, so she must get as much rent out of it and do as little as she can. She seldom visits the farm and prefers to receive the rent by post, as it saves the unpleasantness of an interview with the tenant with its references to repairs.

The buildings are usually most inadequate and unsuitable for their purpose; the roofs let in the sunshine and the snow; the pig and cow share the same shed, and as likely as not the former gets through into the crib and renders the cow's hay quite unsavoury. Should an animal fall ill there is no isolation for it. The poultry-house is too often a discarded piggery unfit for use as such, by reason of the frequent and numerous deaths that took place therein. The stable has no drainage, nor ventilation, and, in the rough loft above, the hay becomes impregnated with the animals' breath and the effluvia from beneath. The garden wall is, to use an Irishism, as often as not a mixed hedge, through which the old sow makes her way just as the young potatoes are fit to dig and her owner has gone to market. As often as not there is no other gate than the entrance one, the gaps in the hedges being filled in with the tenants' makeshifts. Where such a state of affairs as this exists a poor landlord inevitably makes a poor tenant. As before stated, small holdings do not pay as investments. The tenant hangs on in the hope of something turning up; the place will be sold some day, and somebody he knows may buy it. He is not going to improve it for his landlord, and therefore it goes back more and more; the tenant has no interest in it beyond getting the most out of it with the least exertion.

Another difficulty the small tenant has to contend with is that he cannot produce such good stock as his neighbour, who is in a larger way. If the latter gives 60*l.* for a pedigree bull, it is but 2*l.* per cow on his dairy, and the calves are fully worth this extra amount when they are dropped. But if the small man gave 60*l.* for his five-cow dairy, where would his return be then in proportion to first cost? He can therefore only hire service, and must, perforce, be content with what he can get in his immediate neighbourhood. In Ireland a generous Government provides first class bulls for the benefit of the small holders; but such a beneficial arrangement has not as yet been instituted for the small holders of England. In fact, many of the so-called "Farmers' Clubs," and smaller agricultural societies, would do far more good by providing first class stud animals for their districts than by holding annual shows. An alternate stud year

and show year would help their districts considerably. The small holder cannot hope to do much as a "show" man by reason of his limited selection, for it is easier to pick a "show" animal out of twenty than out of five; so he cannot be looked upon as likely to improve our various native breeds of live stock. He may perhaps keep one or two working mares, including a light-legged one for running to market as well as for working on the land; but to breed from such is to court disaster. The first difficulty is to obtain a first class sire, for King's premium horses are few and very far between. Besides, a light horse has very little market value until it is at least five years old, and during this period it is grazing on the small holding, and is an expense in other ways beside; while a cow could more profitably consume the grass. It needs training, such as the small farmer finds it quite impossible to provide, and so he must sell to a dealer instead of direct to the user.

The other mare kept is usually a powerful cart one, with, in many cases, a blemish or some unsoundness. From this a colt is bred and sold as a sucker; but it seldom makes a high price. As the mare has to work on the holding, the foal has many hours of solitary confinement in the insanitary stable, where it frets and pines. In the stress of work the mare is not allowed to cool before the foal has access to its dam, who is not over burdened with milk by reason of short feed. Work, however desirable whilst a mare is in-foal, is not so desirable when she has a foal with her. The foal, therefore, when it is taken to the September fairs, usually looks a bit rough and undersized, and has the disadvantage of an unsound dam, which the intending purchaser speedily notes and uses as a lever for forcing down the value. On larger farms such a foal could be kept until two years old, and then could be broken and made to earn its living whilst growing into perhaps a useful animal; the small holder has no such chance. It may be remarked, "Why not breed better ones?" The first essential is a well-bred mare, but with noblemen, gentlemen, and large breeders on the look out for it, the small farmer has with his limited capital but a small chance of obtaining it. If he gets one of fair average quality, he will not find such difficulty now in mating it with a high class sire as he would have done a few years ago, and at a fairly moderate service fee. But, taking into consideration service fee, insurance, loss of time and lessened capacity of work, it scarcely pays to breed when the mare's time can be otherwise fully occupied. He has no accommodation either for early foaling, therefore this must be timed for April or May, just when the arable lands require working.

As regards cattle, small farmers can and do carry a big head for their number of acres. When a cow drops a heifer calf, the latter is kept for rearing, and in a few days finds itself in the weaning house. A bull calf is usually made into veal. If from a heifer, it is allowed to run with its dam until it weighs about 100 lbs. dead weight, and then it is sold to the butcher as a "runner" or "suck-tit," scarcely making top value, however, as its veal is generally red. If it is the calf of a cow and intended for fattening, it is taken away from its dam at the end of a week and put on a stage and induced to suck by means of a finger. The calf, as it gets older, continues to be fed on whole milk, mixed with oatmeal. At from eight to ten weeks old it usually weighs from 140 lbs. to 160 lbs. dead weight, and realises from 8*d.* per pound, or even higher during the early spring months, down to as low as 6*d.* in the warm months of summer, when veal will scarcely keep fresh for twenty-four hours.

Sheep are not a success on these small farms. There is not change enough, and a breeding flock soon becomes "stained." Consequently, in the West of England, the breeding is confined to half a score or a score of horned ewes bought at some autumn fair. Then, when they drop their very early lambs, both are pushed forward for the butcher, and the land is free of them when the cattle come out of the house in the spring. But with foreign importations and cold storage to contend against, the early lamb trade is not what it was. Consequently, small farmers now prefer to purchase a score of wethers in the autumn, allow them to run over the pastures and then with corn bring them out fat in the spring. If there is no death in the flock a very fair return may be obtained in this way. But from a sheep breeding point of view the small farm is quite out of it at this period in the world's progress, when the vast ranches abroad can supply us with mutton at fivepence and wool at fourpence halfpenny a pound.

The little man, however, can and does breed pigs. The number of pigs bred on farms not exceeding fifty acres would be a most interesting return. It is marvellous what a number of youngsters four or five sows will produce, and a vigilant owner loses very few indeed through neglect at farrowing, by overlying and other causes. They can be sold at weaning time, at from seven to eight weeks old, when they have cost their owner little beyond the sows' maintenance; or he can keep them on the skim-milk from the dairy, and feed them for pork at from sixteen to twenty weeks old; a favourite method. Another course is, after weaning, to allow them to run rough, and with little aid to grow into bacon stores; for these there

is usually a good market amongst cheese-makers, who require them to consume surplus whey and for conversion into bacon. It is well that the small farmer should sell his stores, but sometimes he tries to convert them into bacon on his own account. This is a mistake, for the cost of meal, &c., coupled with the length of time which elapses until the pigs average nine score each, leave very little profit at the finish, mainly because bacon prices are ruled by foreign imports, whereas with pork the case is different. But there is one feature which tells against the small farmers' successful pig-breeding, viz., what may be styled the half-crown "parish boar." This is usually the property of some small owner, and is kept by him in a hovel filthy enough to breed swine fever. It has been selected and kept more on account of the size of its litters than for the quality of them. They may be heavy shouldered and razor backed, but the boar is popular because the litters are large. Such a prolific stock must not be lost, so the gilts are saved, and in due course comes the further evil of inbreeding with weaker litters, and as the popularity of the boar spreads, it is liable to become overworked. No reasonable limit is put to the number of its services, so long as its owner receives his fee. Foreigners have realised the desirability of using first class boars and pay big prices to obtain our best pure breeds; but the pigs of the average English small farmer are mongrels. There is no well-considered system of crossing, and the breed in vogue in each district is determined by the type and character of the "parish boar."

In Ireland good boars are selected by Government and the Royal Dublin Society, and sent into the rural districts for the benefit of Irish farmers. A similar provision is very much wanted in many parts of rural England to-day. Taken all round, with good and bad years, pig breeding and pig feeding will continue to be, as at present, one of the sheet anchors of small farming, and therefore it is desirable that more attention should be paid to raising the type of pig suitable for competition with the foreigner's animal.

Another feature of small farming is poultry breeding. Every year more attention is being given to this, and it is being conducted on far more intelligent lines than in the old days when it was looked upon as being merely the wife's perquisite. Nevertheless, in the olden days, the barn-door fowl was a useful one, instead of being, as now, a mixture of breeds. A white Leghorn cockerel is purchased and turned down one year, the next year a Cochin or Langshan, and following this perhaps a soft-fleshed Andalusian or a Game. The crossing has not been carried out with skill. Some have all layers and no

sitters, others have table fowls and poor layers. But thanks to the influence of skilled lecturers supplied by the Education Committees of our County Councils and Agricultural Societies, this ignorance is diminishing. Poultry breeding is undoubtedly a very desirable adjunct to any small farm, where waste materials from other sections help to feed the birds. But competition in this direction is growing monthly; the vast importation of foreign eggs, the improved methods of preservation, and the imports of frozen poultry, have all tended to diminish the profits of poultry raising, though a man who has a few of the right strains approved by the "fancy" may continue to make money if he keeps his breed well to the front.

Whilst market gardening must be considered as distinct from small farming, fruit growing, on the other hand, especially apples and pears, will be found a great help to it. Cider apples do not yield the same return as table fruit, and the latter costs not a penny more to grow. One year I had two trees in my orchard, a Warner's King and a Horner, both yielding four sacks of fruit. The former realised 5*l.*, the cider fruit 8*s.* Fruit trees are usually planted without regard to the season in which their fruit will come on the market. Early and later varieties sell well, but October apples are not wanted. Even in times of the greatest glut a basket of really choice fruit will find a purchaser. Standard apple trees reasonably cared for, taking one year with another, make a fair return. Fruit culture is undoubtedly very appreciably increasing amongst small farmers, and they find it most remunerative.

There is some difference of opinion as to whether small farmers should work for larger ones. A very erroneous idea exists as to the amount which can be thus earned. In the aggregate it is relatively small, because during harvest and other times when wages are high the small farmer must attend to his own holding and sometimes needs assistance himself. If he makes a speciality of butchering, thatching and such like, he can put in a few hours for others with advantage to himself, but this does not apply to ordinary day labour. However, sometimes a small farmer may manage to secure a stone-hauling contract from the Rural District Council, and the money thus earned is very helpful.

The marketing position of the small farmer is not what it was before the foreigner came into competition with him, but, at the same time, the former has certain advantages in the increased facilities now provided for the distribution of his produce. For instance, a pound of butter posted at four o'clock in the afternoon at a village post-office in Somersetshire can be placed by means of the parcel post on a London breakfast

table the next day at a cost of three pence. Railway companies have also granted special rates and facilities for small parcels of agricultural produce. Still, in consequence of the farmer's inability to secure orders at the other end, the trade does not increase as it should. Danish farmers, by means of co-operation, have overcome this difficulty; in fact, their butter fixes our market prices. Sooner or later the small British farmers must combine for purchase and for sale, if not for production, because single-handed they cannot supply a customer for twelve months with all his requirements. But at present the independence of the British farmer is a barrier to such co-operative alliances, and, speaking generally, he would sooner fight and fail on his small holding and then seek another occupation than join with his neighbours in the endeavour to hold his own.

As I have already endeavoured to show, occupying owners are, among small farmers, in the best position. Would that there were more of them! In Denmark and elsewhere Governments assist the tenant to become an owner. In England we have a Small Holdings Act, it is true, but it is one of which few tenants can avail themselves. Under the Act the size of the holding is limited to 40 acres, whereas it might, with advantage, be extended to 100 acres.

To briefly summarise the varying states of small farming at the beginning of the twentieth century, there is first the small capitalist who has his funds locked up in one of these small holdings, and has to obtain as high a return as possible for his money; in fact, he wants to take capital out of, rather than put it into, his land.

Next we have the hobby farmer, who purchases his little estate for amusement or residence. One of this type desires to run his farm upon impossible lines and to pose as a landed proprietor with a country seat, the result being loss of money and much disappointment. Another with more limited aspirations is content with much less and enjoys a very healthful life amid his rural surroundings.

Next there is the occupying owner, who, though not overburdened with capital, makes a living out of his farm, and knowing that every improvement he carries out will be for the direct benefit of himself or family, is ready to do the best he can in this respect.

The successful labourer who has saved enough to turn farmer, and often does well at it, must be included in the list, and lastly comes the small tenant with insufficient capital. He has to face rack rents, high rates, and deficient accommodation, and has, moreover, to meet the keenest of competition with insufficient equipment. He finds old markets closing and new

ones difficult to open up. Having no prospect of ever owning the small farm he occupies, he takes all he can out of it. His family having no hope of ever succeeding him, seek other occupations and, gradually drifting away from country life, help to swell the tide of immigration flowing into our towns. The small tenant farmer, in his weary pursuit of the pounds, shillings, and pence, which seemingly ever elude his grasp, misses whatever halo of beauty may surround country life.

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IX.—*Notes on the Drying and Evaporating of Fruit and Vegetables.*

1. By F. G. FARWELL, the Society's Steward of the Department.
2. By JAS. HARPER, Lecturer and Demonstrator.
3. By the Editor.

1. NOTES BY F. G. FARWELL.

THE notorious waste of fruit in this country, especially in a year of abundance, has directed attention to the possibilities of drying and evaporating fruit, so as to enable the grower to utilise much that hitherto has been little better than a drug in the market.

Croydon being situated in a fruit-growing district, the holding of the Bath and West and Southern Counties Society's Annual Exhibition there afforded a good opportunity of bringing such processes under the notice of the public. So Mr. Harper, who has been very successful in drying fruit for sale at his home in Gloucestershire, was asked by the Society to give a series of lectures and demonstrations upon Fruit Drying. For this purpose a pavilion was specially erected in the Show-yard wherein various drying and evaporating machines were exhibited.

Mr. Harper showed, by means of several small ingenious machines, all of American make, how apples were prepared for drying, the fruit being pared, cored, sliced, and cut into rings. The fruit was then placed for about five minutes in brine made by dissolving one ounce of salt in three quarts of water, which Mr. Harper considered preferable to the foreign practice of sulphuring. Unless this was done the apple slices or rings would turn a red-brown colour in drying and would not compare in appearance with the imported bleached or sulphured rings. The pieces or rings were then

placed on a tray, one piece overlapping the other like roofing-tiles, and afterwards put into a patent evaporator supplied by Messrs. Lumley & Co., Limited, of America Square, Minories, London. This evaporator consisted of a stove and oven with a frame work for the trays above. The temperature of the oven is registered by a thermometer and kept at from 180° to 210° F. As soon as a tray was filled it was placed in the frame work, and after remaining there for ten minutes or a quarter of an hour it was, by means of a lever, raised and a fresh tray, which had meantime been prepared, was pushed in below the first one, and so on in succession until the whole frame in the oven was full of trays, the heating being continuous. The time taken for drying varies with the kind and ripeness of the fruit, rings taking naturally much less time than slices, and pippins, which are not sliced, longest of all. After the fruit has been dried it should be exposed to the air for a week or so and may then be packed in boxes or bottles until required for use. Mr. Harper states that, if properly dried, the fruit will keep for an indefinite time, and when required for use should be again soaked in water for six or seven hours. With slight modifications this process is applicable to all forms of fruit—apples, pears, apricots and other hard fruit, as well as vegetables, being placed in the evaporator in trays from the bottom to the top, while soft fruits, like cherries, strawberries, &c., are filled in from the top downwards.

Mr. Harper calculates that from 10 to 12 lbs. of dried fruit can be obtained from 100 lbs. of fresh apples, and that in the machine he uses, costing 100*l.*, he is able to deal with a ton of apples daily. This machine can be worked by a man and a boy at a daily cost of 6*s.* for wages and 4*s.* 6*d.* for coal, and from a ton of apples costing 20*s.* he would obtain 2½ cwt. of pippins, cored apples or rings, which, when packed in boxes costing 5*s.*, would be marketable at 42*s.* 6*d.* per cwt., thus showing a profit of 3*l.* 10*s.* 9*d.* Similarly, 100 lbs. of plums, costing 9*s.* per cwt., would produce 30 lbs. of dried fruit, which would sell at 4½*d.* per pound. The present price of California dried plums is about 45*s.* per cwt.

Mr. Harper showed samples of dried fruit, vegetables and potato chips as supplied to the Government for the use of the troops in South Africa, every ounce of which, he stated, came from Germany. The firm from whom he had the samples told him that during the first five months of the year they had sold 1,000 tons of dried vegetables a month in this country, and they stated that if he could produce as good an article they would give him within 10 per cent. of the selling price.

Other samples which Mr. Harper displayed came from France and Switzerland. He thought that it was a matter of much regret that such articles had to be bought at highly remunerative prices from foreign countries when our home produce could, if treated in the way he had explained, be utilised for the purpose.

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## 2. NOTES BY JAS. HARPER.

The Society's Meeting was held at a time of the year when all kinds of fruit and vegetables were scarce, and consequently very dear. It was therefore somewhat difficult to decide upon the class of fruit to be dried, so as to give a demonstration that would be practical without incurring too great an expense. It was ultimately decided to try Tasmanian apples. I accordingly purchased in Covent Garden Market five or six cases of "Sturmer" apples, these being the soundest and best procurable at that time for the purpose. I had carefully to avoid buying any apples that might have been put into cold storage, because I had previously found that fruit so treated became so soft as to be quite unfit for paring, coring, &c., and when exposed to great heat, would not dry satisfactorily.

Messrs. Lumley & Co. (Limited), of 1, America Square, Minorities, London, kindly lent the Society, for demonstration purposes, two machines, namely, an "Invicta" evaporator (Fig. 1) and a "Gnom" dryer (Fig. 2).

The "Invicta" machine is in use on the Continent, in America and elsewhere, and experience has proved that it will dry anything that is capable of being dried.

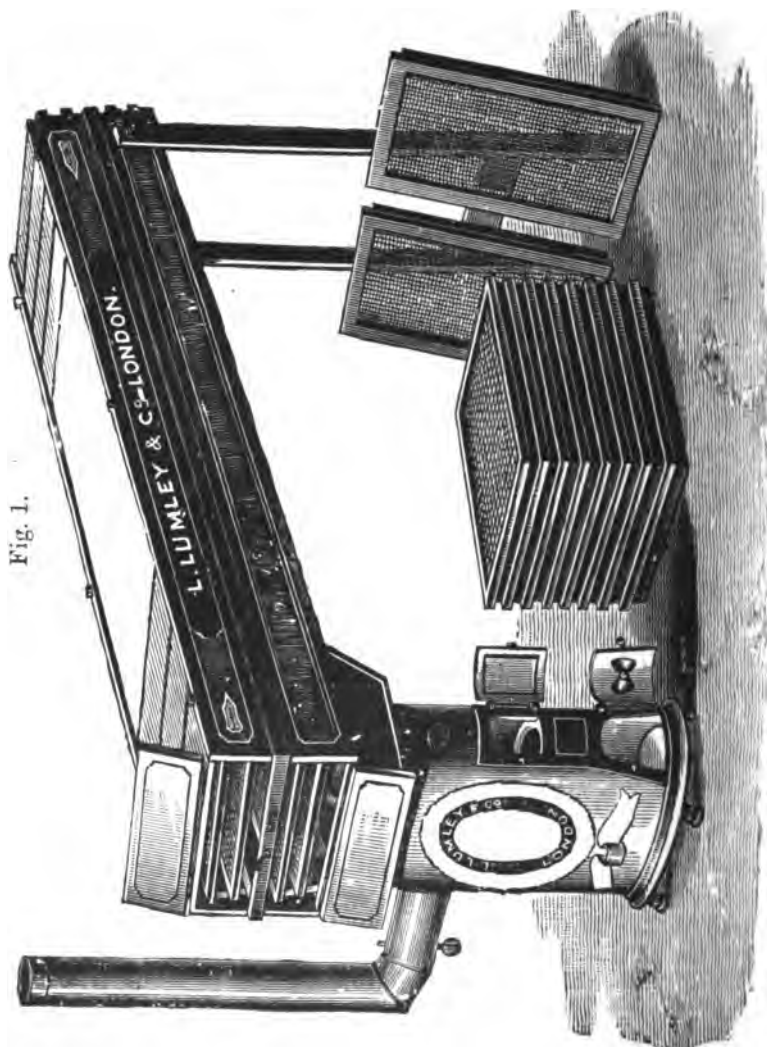
The "Gnom" dryer, which is a similar type of machine, was selected, after competition with others, for experimental purposes by the German Government.

These machines are so constructed that hot air is used for the actual drying of the fruit, and no contamination of the produce can arise through the fumes from the coal or coke used in the furnace. The "Invicta" has two inclined flues for the fruit receptacles, while in the "Gnom" these are directly over the hot air. Personally I have found that for small undertakings and experimental work the "Gnom" is preferable. The "Invicta," however, is more suitable for drying on a large scale, as it requires less attention; whilst the output, although perhaps not so great in proportion, is as good as from the other machine.

Although both machines were on view during the Show, the "Gnom" dryer only was used for the demonstrations, being

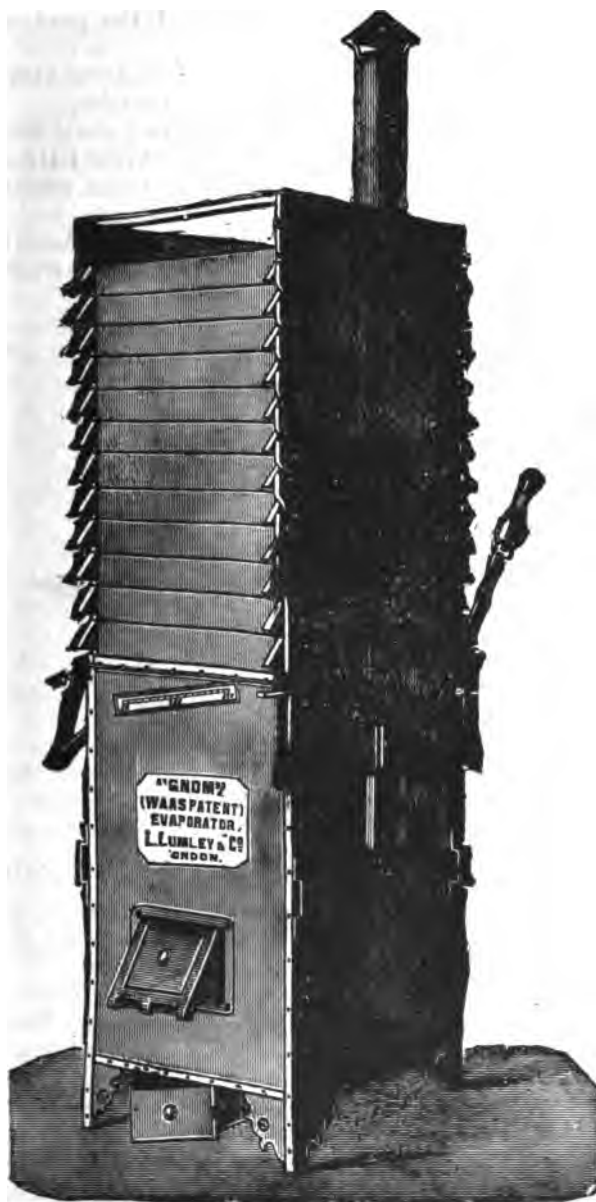
sufficient for this purpose, and requiring less expenditure on fruit and vegetables. It did its work well, and yielded excellent results.

In order to make the demonstration as complete as possible,



a portion of the fruit was dried as cored apples and the remainder as rings. In preparing the apples for the dryer I used the "Bonanza" corer and parer (Fig. 3), which, with all the other appliances, was lent by Messrs. Lumley & Co. When the

Fig. 2.



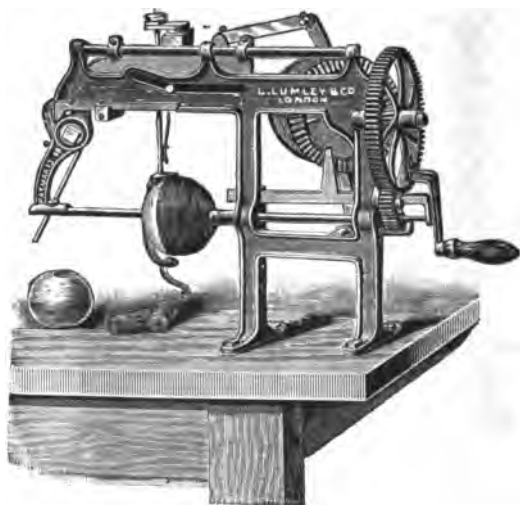
apple has been put upon the spindle, by three turns of the handle all the skin is removed in a very thin paring, the core is taken out, and the apple, the core and the peel are each delivered into different receptacles.

Machines were also exhibited at work for paring and cutting potatoes, for slicing beans, and for stoning cherries.

These cores and parings can be dried and dealt with later on in the year, or can be boiled down at once into jelly or apple marmalade. Parings and cores of apples make uncommonly good jelly.

Plums and prunes are dried by the sun in America, but this is prejudicial to the flavour and aroma of the fruit, which

Fig. 3.



seems to evaporate with the moisture. This is not the case when the dryer is used. In France the fruit is dried in ovens, but in Germany dryers similar to those I have described are largely used.

The best results are achieved by the small operator who dries unbruised and fresh fruit and vegetables. In France and Germany he supplies the fruit in a dried condition to the finishers, and the latter complete the work in factories, where the fruit is put up in bottles for sale. I believe if once the public became acquainted with well-dried English produce and could get a constant supply they would not revert to that imported from abroad.

The demand among bakers for potato flour, or, in other

words, the dried potato ground into flour, is largely on the increase, and there is no reason why, instead of this article being imported from Germany, it should not be produced here. My idea is that the large and more suitable potatoes should be sold in the fresh state, and that the small, which are now often used for feeding pigs, should be dried. The demand for dried vegetables in countries where fresh produce cannot be obtained is also largely on the increase, and they are also bought in very considerable quantities for use on board ships.

In all high-class restaurants there is a steadily increasing demand for dried vegetables made up in the form of soups. Our Army in South Africa is now largely supplied with dried vegetables from Germany. There is no reason why such vegetables should not be dried in this country, and if, as seems not unlikely, such produce is utilised in time of peace as well as war for our Army and Navy, there will be a very large and increasing demand for it.

A large number of persons showed their interest in the subject by the questions they addressed to me after each demonstration, and several gentlemen engaged in the dried fruit trade, both wholesale and retail, assured me that the fruit dried in the showyard compared favourably, with respect to flavour and appearance, with foreign importations, and that there would undoubtedly be a good sale for such produce in this country.

As the work was intended to be educational, samples of the dried fruit were distributed to any visitors who were sufficiently interested to desire to have them.

I do not claim for fruit-drying that it is possible by its aid to get better prices for good sound ripe apples and pears than can be obtained for them in the green state.

With reference to green fruit, I may say that I have found from experience that much better prices can be obtained when it is properly graded. After grading the small sized and misshapen produce can be dried, and would then yield a very fair return for the time and trouble bestowed upon it. I have seen in Covent Garden Market foreign produce nicely graded and put up so as to meet the requirements of purchasers, whereas English produce was either ungraded or graded so badly as to be a source of trouble to the salesman. Grading is successfully carried out in America and Australia, and in America especially the undersized fruit is dried as I have suggested. I am certain, from my five years' study of the whole subject, that there is a very wide opening for fruit and vegetable drying in this country and that it would prove profitable.

## 3. NOTES BY THE EDITOR.

Since the lectures and demonstrations in fruit and vegetable drying referred to in the foregoing notes were held, the subject has received attention in other quarters, and, in response to my requests for information, I have been kindly favoured with the results of some practical experiences, which I have utilised, in the following notes.

In September and October last the Agricultural sub-Committee of the Worcestershire County Council set on foot certain experiments in drying fruit, vegetables and herbs at the experimental garden at Droitwich. These trials were very carefully and systematically carried out by Mr. James Udale, on behalf of the sub-Committee, and the information thereby obtained is certainly deserving of careful attention by all interested in the subject.

The Chairman (Mr. E. W. V. Wheeler) of the sub-Committee in question has kindly permitted me to utilise Mr. Udale's report by quoting from it some of the results obtained by the experiments.

The "Invicta" Evaporator was the machine used.

Twelve varieties of plums were dried, and those named in the following statement gave the best results with respect to the *weight* of the dried product.

The first column states the percentage of dried fruit yielded in each case, and the second and third columns the average time and temperature required for drying.

Name of Plum.	Yield per cent. of Dried Fruit.	Temperature (F).	Hours.
Czar .. .. .	33	180-210	12
White Perdrigon .. ..	27	190-220	16
Victoria .. .. .	25	190-220	18
Monarch .. .. .	25	200-230	15
Prince Engelbert .. ..	25	160-200	14
Red Magnum Bonum ..	22	180-200	12
Cox's Emperor .. ..	20	220-240	16
Pershire .. .. .	19	160-220	16

Those varieties which presented the best appearance after drying were Monarch, Prince Engelbert, Czar, Victoria and White Perdrigon in the order named.

Two varieties of damsons, viz., Farleigh Prolific and Shropshire, were dried. The former yielded 33 per cent. of dried fruit, and required seven hours for drying, and the latter

yielded 25 per cent. and required six hours for drying. The temperature in each case was 160–200° F.

One hundred and thirty-five lbs. of Shropshire damsons required fifty-four hours of continuous drying, the fuel consumed being 1½ cwt. of good house coal, costing 1s. 2d. per cwt. The average charge allowed for labour—fruit-drying being a very suitable work for females—was 2s. per day. Whilst the fresh fruit cost 3s. per bushel of 80 lbs., allowing for these charges, the damsons, when dried, had cost 4½d. per lb., and the Victoria, Monarch, Perdrigon and Cox's Emperor plums 4d. to 4½d. per lb.

The surplus plums and damsons were sold wholesale and realised from 4½d. to 6d. per lb.

Mr. Udale thinks that there is a prospect of plum-drying especially becoming a remunerative industry in this country in years of great abundance of fruit and of very low prices.

He says: "I have tested the eating qualities of the second grade Victoria plums (I thought if the second grade were good, the first grade would be better) after gentle stewing for thirty minutes, with the addition of a little lump sugar, and I was more than satisfied with their quality. They were clean and delicious, and superior to any French plums I have bought at any time at 6d. per lb. retail."

Samples of French and Californian dried plums were bought at 10d. and 6d. per lb. respectively, for comparison with home grown and home dried plums, and competent judges agreed that in appearance—

The Monarch surpassed the French	at 10d. per lb.
Prince Englebert " " "	" 6d. "
Victoria " " Californian	" 6d. "
White Perdrigon " " "	" 6d. "
Czar " " "	" 6d. "

and that their quality in order of merit when stewed gently for thirty minutes was:—

- 1, White Perdrigon; 2, Victoria; 3, French at 10d. per lb.;
- 4, Californian, at 6d. per lb.; 5, French, at 6d. per lb.;
- 6, Pershore.

The tenderness of the skins *before* stewing varied in the following order:—

- 1, French at 10d.; 2, Victoria; 3, Pershore; 4, White Perdrigon; 5, Californian and French, at 6d.

Four varieties of apples were dried whole, the results being as follows:—

8 lbs. fresh fruit of Cellini gave	..	1 lb. 12 ozs. dried product.
10 " " New Hawthornden	2 lbs. 8 " " "	
10 " " Lane's Prince Albert	2 " 4 " " "	
12 " " Red Hawthornden..	4 " 0 " " "	

The first-named apples were large, and were dried as gathered from the tree, the three others being small or third size fruit. The small fruit dried in from seven to twelve hours, and the Cellini in about eighteen hours.

Those dried in seven hours were subjected to a temperature of from 220–250° F., and the others to a temperature of from 180–200° F.

Eight varieties of apples, viz., Cellini, Bramley's Seedling, \*Ecklinville, \*Ringer, Lord Suffield, Lord Grosvenor, \*Lane's Prince Albert and \*New Hawthornden, were peeled, cored and sliced. Those marked with an asterisk were small apples only; the others were large and small, as gathered from the trees.

The best results were obtained from Bramley's Seedlings, Lord Grosvenor, Lord Suffield, and Ringer in their order of merit, followed in the same order by Cellini, New Hawthornden, Ecklinville, and Lane's Prince Albert. The average yield was 15 ozs. of dried product from 11 lbs. of fresh fruit. The weight given is that when the slices were removed from the evaporator; but as the dried product absorbs atmospheric moisture, the weight is in a few days considerably increased, but this depends a good deal upon atmospheric conditions.

Mr. Udale is of opinion that if 5s. per cwt. can be obtained for good apples, it is best to sell them undried; but that small apples might pay for drying and for making into jelly.

Two varieties of pears were tried: Williams' Bon Chretien, 10 lbs. of which gave 2 lbs. of dried product; and Beurré d'Amanlis, 20 lbs. of which gave 3 lbs. 10 ozs. of dried product. They were peeled by the peeling machine, cut in halves, and cored by hand. They dried in nine hours in a temperature of 200–240° F.

Six pounds of Morello cherries were dried and gave 1 lb. 14 ozs. of dried fruit. They dried in twelve hours in a temperature of 160–200° F.

*Potatoes.*—Sharpe's Victor and Sutton's Ringleader were peeled and sliced, and dried in a temperature of 220–240° F. They lost about four-fifths of their weight in drying, and took an average of five hours in the process.

Runner or kidney beans were sliced by a slicing machine and then dried. Thirty pounds of beans gave 2½ lbs. of the dried article when weighed immediately after drying; but these absorb atmospheric moisture in course of time, and increase in weight. One portion dried in four hours in a temperature of 200–240° F.; the other portions were six hours drying in a temperature of 130–140° F.

The herbs experimented upon were subjected to a tempera-

ture of 130–140° F.; and marjoram dried in 45 minutes, mint in 50, savoury in 55, thyme in 60, sage in 75, and parsley in 90 minutes. The sage and parsley retained their fresh colour, but the others became dull, as when dried in the ordinary way.

The experiments demonstrated that all kinds of vegetables and herbs can be dried successfully; but the trials were not on a sufficiently large scale to show whether or not the results would be commercially remunerative.

The following are some of the lessons learned from the experiments:—

1. Ripe fruit dries more quickly than unripe fruit; the latter being several hours longer in the process, and therefore more costly to produce.

2. Unripe fruit loses a larger percentage in weight during the drying process, and is not a good colour for its kind or variety when dried.

3. Large fruit of the respective kind or variety produces the finest dried article of the same variety or kind.

4. Small specimens of the same variety of fruit or vegetables dry more quickly than larger ones.

5. Stone fruit, such as plums, cherries, &c., should be exposed to a low temperature at first for several hours, and have the temperature gradually increased as evaporation proceeds.

6. Apples and vegetables may be exposed at once to a moderately high temperature, and finished in a lower temperature.

7. Stone fruit should be placed on the trays with the stalk ends uppermost.

8. Fruit of different sizes should not be placed upon the same tray, and small should not be mixed with large fruit.

9. Apples and pears, *immediately* after peeling, should be immersed in a weak solution, consisting of one ounce of salt to three quarts of water. If left exposed to the air after being peeled they quickly discolour.

Mr. Udale thinks that the Evaporator he used (No. 0, Dr. Ryder's patent, with twenty trays) was too small for commercial purposes. He says: "It required as much attention—and in respect to the regulation of temperature, more care—as one of three or four times its capacity. It is also very wasteful with fuel; because the Evaporator consists of only one short flue or air-chamber, through which the hot air rushes immediately into the atmosphere and is lost. For those two reasons the cost of labour and fuel is unnecessarily great, and the cost of the dried article much higher than it would be with an evaporator of larger capacity."

He considers that the preparing and drying of fruit and vegetables can be soon learnt by any intelligent man or woman, and that it is work well adapted for women especially.

Two silver medals and a bronze medal have been awarded to the Worcestershire sub-Committee for their samples of dried fruit and vegetables by the Royal Horticultural Society, Birmingham, the Midland Counties' Chrysanthemum, Fruit and Floral Society, and the Tamworth Chrysanthemum and Fruit Society.

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Lord Heytesbury, a Member of the Bath and West and Southern Counties Society's Council, who purchased an "Invicta" machine after seeing it at work at Croydon, kindly wrote me as follows: "I am strongly in favour of fruit and vegetable-drying, in which, if it is worked *upon a large scale*, I believe there is money. I have been very successful, as far as good samples are concerned; but, as I bought only a small machine, and had to pay the same for labour as if I were working a large one, I am naturally out of pocket. My man, who was a novice, was often standing idle because the machine was full, when, with a larger machine, he might have been earning money. I believe that where the wife and children of a small holder can work the industry at home by drying what they produce on their holding, the result would be satisfactory and profitable."

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Miss Edith Bradley, of the Lady Warwick Hostel, sums up her experiences with an "Invicta" machine in the 'Woman's Agricultural Times' thus: "I think that by great care and economy, and general experience in buying the right fruit at the right time, and ascertaining which gives the best results with the least waste and expenditure, as well as considering any by-products and small things, such as herbs and lavender, and so on, money is to be made in this industry; but the machinery must be considerably cheapened, and smaller appliances made more complete, before we can ever hope to see the great results which are suggested by Mr. Harper, the indefatigable advocate of evaporated fruit. At the same time, far be it from me to wish to discourage in the smallest way an endeavour to encourage fruit-growing and preserving in any form. The Americans and Germans make a success of fruit-drying, why not we? I feel sure it is to be done; but I do not feel sure that we are altogether on the right lines yet, although we may be turning in the right direction to find them."

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With reference to Miss Bradley's experiences, the Rev. G. F. Eyre, of the Agricultural Organisation Society, Limited, writes as follows:—

"No one, I believe, would advocate the drying of any produce which can be sold at a profit in its fresh state. But we unfortunately get frequent 'gluts' of fruit, &c. It is essential that the produce to be dried should be booked as costing almost nothing when fresh. This is the value of the process to the British farmer and market gardener, as it enables him to entirely prevent all waste. I believe it to be a sound maxim that loss is often incurred simply by waste. You give the cost of damsons as 6s. per bushel, but mine before drying were only worth 1s. 8d. per bushel. This would give me at wholesale terms a product worth 3s. 6d., because the fruit that I dried was on my farm and did not pay me to send to market at the rate of 1s. 8d. per bushel. Again, take the cost of vegetables. We have them on the ground and annually throw away large quantities when thinning out; also a certain quantity is left in the ground which would be better taken off, if it were worth one's while to do so. I have found that, provided the vegetables, &c., are in a proper condition as regards ripeness, their size and shape make no difference to their value for drying purposes. The only method which promises commercial success will, I think, be found in the working of these machines by Co-operative Societies. These Societies will at the same time grade and market the best of the produce in a fresh condition, thus they will be able to get supplies for their evaporator at practically no cost at all. It would pay them to throw away the small and ill-shaped, but it will pay them better, probably, to dry it, and when they get a sufficient quantity of it to put it on the market. These views are at present, of course, chiefly theoretical, but if the foreigner can make a profit out of it, there is no *primâ facie* reason why we should not do the same."

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Having ascertained that Mr. R. Martin Holland, of Overbury Court, near Tewkesbury, had been experimenting in fruit and vegetable drying, I asked him if he would give me the result of his experience, and he very kindly wrote me as follows:—

"In response to your request that I should give you my experiences of fruit-drying, I have jotted down the following account of our first season's work.

"It had always seemed to me that there must be something very radically wrong with our English methods of dealing with fruit, in that we should each year import, from countries whose

fruit and vegetables are no better than our own, vast quantities of machine dried fruit, and yet should at the same time, whenever we were blessed with a more plentiful year than usual, leave thousands of tons to rot unpicked.

"I had felt certain that there must be some way to combat this waste, but prior to the Bath and West Society's Show at Croydon last year, I had never seen fruit-drying in operation, and had only read one or two scanty articles on the subject.

"I was much interested in a conversation I had with Mr. Harper at the Show, and I came to the conclusion that the system of fruit evaporation advocated by him was worthy of trial. I therefore arranged with him that he should give a demonstration of fruit-drying at the Overbury Village Flower Show, on July 25th last, and should then instruct two of the village women in the art. During the two days he spent at Overbury, Mr. Harper showed the women how to dry French beans, potatoes, herbs, lavender and cherries, using an 'Invicta' Evaporator, No. 2. When the Show was over, this machine was moved to an old cart shed which had been adapted for the purpose, and for the next few weeks, the plum crop being not yet ripe, little was done beyond occasional experiments. When the plums began to come in, work was started in earnest, and the machine was kept going all day, but beyond being stoked up at about 9.30 P.M., was not attended to at all during the night. This was a mistake, for when drying is going on, the machine should be kept going night and day. In working, it was found that the plums took considerably longer to dry than the time given in Messrs. Lumley's (the agents for the 'Invicta' evaporators) book, and that there was at times a danger of scorching the fruit, especially in the angles of the trays, where the heat seemed to be reflected from the wood, at lower temperatures than those given in the book—240° to 300° F. This could be prevented, either by lowering the temperature of the stove, or by admitting cold air by opening the door, but either of these operations needs much care, and it has always seemed to me a fault that there was no separate chamber in which the temperature of the air could be equalised.

"Owing to ignorance as to the working capacity of the drier, the speed of drying was over estimated, with the result that too large a stock of plums was got in, many of which became over-ripe, and therefore useless for drying. For it must be borne in mind that to obtain good results, the plums must be just ripe—no less and no more. In consequence of this mistake, out of 6,664 lbs. of plums brought in to be dried, no less than 2,784 lbs., or 41.77 per cent., were useless for drying. I am told that in France, when the fruit is coming in

too rapidly, it is customary to partially dry the plums, and leave the process to be completed when the pressure of work diminishes. I must further add that a comparison between the French prunes and the Overbury dried plums shows that last year we dried our fruit considerably more than was necessary, for in France, when the first process is completed, it is usual for the drying to be done by the orchard owners, who then sell the fruit to be finished in the factories.

"The following Table gives the varieties of plums dried, and the results :—

Name of Plum.	Plums dried.	Result.	Percentage.
	lbs.	lbs.	
Victoria .. .. .	202	74	36·66
Small black plum .. .. .	72	23	32·00
Prune d'Agen .. .. .	746	194	26·00
Black Diamond .. .. .	87	22	25·30
Barley Plum .. .. .	56	14	25·00
Damsons .. .. .	446	107	24·00
Greengage .. .. .	50	11	22·00
Pershire .. .. .	1,278	372	21·28
Czar .. .. .	100	19	19·00
Orleans and Goliath .. .. .	843	117	13·87
	3,880	853	21·98

"The balance-sheet for the plum drying would read, approximately, as follows :—

	£	s.	d.		£	s.	d.
To purchase of plums ..	11	6	2	By Stock—			
" labour (two women at 1s. 6d. per diem, each)	6	18	0	853 lbs. at 6d. ..	21	6	6
" fuel .. .. .	1	5	4				
" rent .. .. .	0	8	0				
" plant, £60 (depreciation 5 per cent.) ..	0	10	0				
Balance .. .. .	0	19	0				
	21	6	6		21	6	6

"It will thus be seen that there is a small balance of profit, just sufficient to pay about 5½ per cent. on the capital invested, viz., 100%, during the time engaged in plum-drying. It must be remembered, however, that had it not been for the serious loss of over-ripe fruit the profit would have been considerably greater, and that another year the experimental stage would be over, and the speed of working considerably increased.

"When the plum season was ended, a second-hand 'Invicta'

Evaporator, of more than double the capacity of No. 2, was purchased, and it was decided to build a new shed, more conveniently situated, to hold the two machines. This shed was not finished till the middle of November, so that of the greater portion of the apples dried, no very large quantity, owing to the scarcity of apples in the neighbourhood, were dried in the old machine in the cart-shed.

"From 2,955 lbs. of apples brought to the shed, the weight of the peelings and cores, 664 lbs., has to be deducted, leaving 2,269 lbs. placed in the evaporator, the weight of which when dried was 218 lbs. The temperature of the drier varied from 200–260° F., and the time occupied in drying the cored apples averaged some fifteen hours, while the sliced rings took from six to seven hours. With such a slow rate of drying, and no means of boiling up the waste peelings and cores for jelly, it was found impossible to make a profit. A boiler was therefore purchased, and when the new shed was ready the waste was utilised for making jelly. It was then found that the making of the waste products into jelly would turn the previous loss into a slight profit, which was still more largely increased when the large drier started work; for instead of taking some fifteen and seven hours respectively for the pippins and the rings, it was found that they could be dried in some ten and four hours, and I think this time can be still further shortened. I can give no balance-sheet for the apples as I can for the plums; for the working in two sheds, and the cost of moving, so complicated the accounts that it is impossible to give an accurate statement. As the result of my five months' working, I am convinced that there is a future for this fruit-drying industry in England; and I am hoping that this year, with the two machines working, I shall be enabled to show that a very fair profit can be obtained.

"As regards the quality of the fruit when dried, this should be as fine as any that is imported into England for cooking purposes. I am writing more particularly with reference to the plums that have been done at Overbury. Those who have tried them stewed, declare that they are better and taste more of the plum than any prunes they have eaten. But so far, I have had none of the apparatus necessary for finishing them for dessert purposes; but I have no doubt that so treated, such plums as the Victoria, Czar, and Prune D'Agen, will prove the equals in every respect of the French and Californian imports. The Prune D'Agen, which is the plum grown for the purpose in France, dries most excellently. It is, I believe, very little grown in England. Those dried at Overbury were very kindly sent me by Mr. C. D. Wise, of Toddington. The dried Pershore

plum makes a very good dish when stewed; but its appearance—it is a light brown colour—detracts from its merit in the eyes of customers accustomed to the black French prunes. Good cooking apples and much of the cider fruit make as good pippins and rings as can be obtained.

“I have done very little with vegetables as yet, but can see no reason to doubt that most kinds can be profitably dried. I consider that any fruits or vegetables which are imported dried into England, but which are grown extensively over here, can be profitably dried in this country.

“As regards the machines, I cannot say that I am entirely satisfied with them, but I know of no better. In my opinion, a perfect machine should have:—

“(1) Some means of drying the air (at present, especially on a rainy day, it is warmed, not dried).

“(2) A chamber where the air is mixed and made of an even temperature.

“(3) An arrangement for automatically regulating the temperature, and for giving warning when it rises or falls beyond certain limits.

“(4) Some method of driving a much faster current of dry heated air over the fruit.

“(5) An arrangement to regulate the heat, so that if necessary it should yield the same temperature in both upper and lower flues.

“I do not think that drying can be carried on profitably as a commercial undertaking, with labour to be considered, on so small a machine as a No. 2 ‘Invicta,’ for in any case the work needs two persons to run it economically, and two persons can efficiently work a much larger machine.

“Those who wish to learn more about fruit-drying, and are able to read French, will find a very practical work in ‘*Traité Pratique du Séchage des Fruits et des Légumes*,’ par J. Nanot et L. Tritschler, published by Librairie Agricole, de la Maison Rustique, 26, Rue Jacob, Paris, price 3 fr. 50 c.; or it can be obtained from Messrs. Hachette, 18, King William Street, Strand, London, W.C.”

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The Rev. G. F. Eyre (referred to on page 101), of Far Forest Vicarage, Rock, Worcestershire, who last summer purchased a small-size “Invicta” machine, has kindly written further to me upon the subject. Briefly summarised, his views are that, whilst the machine can be made to give very fair results even in almost inexperienced hands, fruit-drying, to be commercially

successful, must be conducted on a larger scale than was possible with the machine he used. At the same time he says:—

“I have now damsons, which when fresh were worth at local rates 2s. 6d., which are now (dried) worth 6s. All my wind-falls were gathered up and dried, instead of being sent to drag down the price of good fruit. My own idea is that the drying should be combined with fruit-bottling.”

He thinks that the best results are only likely to be obtained by means of a moderately large plant for a whole district, and not by a number of independently worked small machines. He further adds:—

“For the establishment of such a new industry I think that co-operation offers the best hopes. It has been taken up by the Irish Agricultural Organisation Society, who have had Mr. J. Harper over to give it a start, and at home our own Agricultural Organisation Society have gone into the matter as well. They have obtained facts as to the demand for the produce from the Admiralty and War Office, and have also, of course, the Official Returns, showing that last year we imported 140,000% worth of produce to take the place of that which had been wasted at home. They have also proved that as good a sample can be produced in Worcestershire as anywhere abroad.”

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The foregoing experiences, from different sources, indicate that fruit-drying is likely to be most remunerative when conducted upon a large rather than upon a small scale.

With respect to this, Mr. Harper himself wrote to me as follows:—

“Throughout my advocacy I have endeavoured to induce persons interested in fruit-drying to try small machines experimentally at first, but I have always said that while the use of these small machines would prevent a good deal of fruit being wasted, larger machines must be used, and drying carried on generally on a large scale, to ensure the most successful commercial results. I believe that, if the largest size, ‘Gnom Waas’ and ‘Invicta Rider’ are tried, as I have tried them, satisfactory financial results will most certainly accrue.”

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Messrs. Jones, of Northingtoun, Grimley, near Worcester, have recently patented a new method of hop-drying; and, by arrangement with this firm, some representatives of the Agricultural Organisation Society, on January 31st last, carried out

some experimental tests, with a view to ascertaining if the same machinery could be utilised for fruit and vegetable-drying also. Apples, potatoes, carrots, cabbage, celery, &c., were dried, and the results were considered to be very satisfactory. The heating and drying apparatus consists of a number of sections of vertical coils, or radiators, mounted on a platform, enclosed in steel casings, and provided with a fan with a direct attached steam engine. The fan changes the air at the rate of 5,000 cubic feet per minute, and there are 4,000 feet of coil through which steam is continuously passing, and thence under the floors of the drying rooms, which floors are made of strips of wood placed  $1\frac{1}{2}$  inch apart, these being covered during hop-drying with hair matting, upon which the hops are spread. The method of adapting the plant for vegetable-drying was to utilise the fan and heater, but to use only a portion of the hop floor, which was done by building a small chamber, 12 feet by 12 feet, or 144 square feet area, upon the hop floor, continuing the walls of the chamber beneath the said floor, till they rested on and formed a joint with the masonry floor below, the position of the chamber being such, that the duct from the fan and heater opened into the lower portion of the chamber below the hop floor; thus all the heated air had to pass up and through the chamber. The temperature is easily regulated by means of taps, which increase or retard the flow of the steam through the coils.

Of course, such a method would only be applicable to drying on a large scale; but it would be a great advantage to be able to utilise the kilns for drying fruit and vegetables during the greater portion of the year when they are not required in connection with hops.

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X.—*Report on the Churnability of Cream Trials carried out at the Society's Show at Croydon, May, 1901.* By ERNEST MATHEWS.

THE words churnability and non-churnability have been lately used to denote the ability or inability of cream or milk to yield the maximum weight of butter from one churning. It is obvious that if the maximum weight of butter is not obtained from a single churning, in most cases there will be loss, few taking the trouble, either in private dairies or in factories, to keep the buttermilk separate, and churn it again.

The yield of butter may be affected by the following causes:—

- (a) The breed of the cow.
- (b) The health of the cow.
- (c) The feeding of the cow.
- (d) The age of the cream.
- (e) The temperature of the cream and churn.

But it is only the first and the last three of these headings that are affected by these trials, as the milks dealt with were the product of animals, all in good health.

In the various butter-test trials of individual cows which have been carried out for some years in the Showyards, there have been several cases where a second, and sometimes a third, churning of the buttermilk has been necessary to obtain the full quantity of butter; but as in those trials all the creams have been of the same age and treated exactly alike, the cause of the non-churnability must be looked for either in the breed, the health, or the feeding of the particular animal.

With respect to the health of the cow, there has never been any difficulty, as if an animal is off its feed from any cause the fact is invariably reported to the Judges, so that the failure to churn in any such case is attributed to this cause.

The question of feeding is different. Stockmen do not as a rule care to say how the cattle being tested are fed, but the comparatively few cases where cream has not churned well through this cause, have been easily traceable to the forcing character of the food, which has been given to encourage quantity of milk, at the expense of quality.

The breed of the cow is a more difficult question, the cases of non-churnability usually occurring in the milk from those breeds of cattle which are credited with having mainly small fat globules.

In order to try and solve the question of churnability, the Council of the Bath and West Society were kind enough to approve the trials which form the subject of this Report.

The breeds originally selected by the Council were Short-horns, Jerseys, Guernseys, Red Polls, and Sussex; but as there were only two cows in the Red Poll, and one cow in the Sussex Classes, Kerries and Dexters were substituted for the two latter. It was decided to experiment with "sweet" and with "ripened" cream.

In order to obtain absolutely sweet cream, it was necessary to separate and churn the milk immediately after milking; consequently, only the morning's milk was available for the sweet-cream trial. As the milking and butter-test trials

required the milks of the competing cows on Friday, the only milk obtainable was that taken from the cattle on Wednesday evening and Thursday morning, May 22nd and 23rd.

The milk on the Wednesday evening was set apart for the ripened-cream trial, and the milk on Thursday morning used for the sweet-cream trial, the sweet cream being churned on Thursday and the ripened cream on Friday morning. This allowed thirty-six hours for the cream to ripen in the one case, and in the other the cream was churned within an hour of separation.

The milk for the churnability trials was taken as far as possible from those animals that were entered in the milking trials, and not in the inspection classes. The milks of the Shorthorns and Jerseys, with one exception, came from cows which were not being shown for points, and therefore the milk of Wednesday evening may be considered in their case as normal. All the Guernseys were exhibited in the Show-ring, and their milk being a secretion of only about six to eight hours' duration, must be regarded as rather abnormal. The Kerries were all exhibited in the Show-ring, and were so few in number that it would have been difficult to procure a sufficient quantity of milk on the evening of Wednesday to carry out the test. Therefore the milk which was taken from them after they had been judged in the inspection classes was also used. This when added to the evening's milk was sufficient for separating on Wednesday; but it cannot be considered as the normal milk that would have been obtained from the cows in the evening had they in the morning been milked at their usual time.

The milk used for the sweet-cream trials may be looked upon as normal in every case, as the cattle had the whole night to rest in, and were milked at their usual time.

The word normal is used with some reserve, because, of course, it may be urged that a Showyard is not the best place to carry out trials of this description, since cattle get excited amid strange surroundings, and the milk may consequently be affected. It should, however, be remembered that, except in a Showyard, it is almost impossible to get the various breeds of cattle collected together in one spot, and the averages of the butter-test trials and the butter ratios, when compared with the churnability trials, show little, if any, difference between the milk of the first and second, and the milk of the third day.

Samples of the milk both morning and evening were taken by me and handed to Dr. Voelcker for analysis.

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The following Table shows the full analysis of the morning and evening milks used:—

ANALYSIS OF MILKS.

	SHORTHORN.		JERSEY.		GUERNSEY.		KERRY.	
	Morning.	Evening.	Morning.	Evening.	Morning.	Evening.	Morning.	Evening.
Water ..	88·10	87·35	86·50	84·05	86·50	84·00	87·05	84·32
Fat .. ..	3·00	3·85	4·45	6·37	4·65	6·85	3·95	6·80
Solids not Fat .. }	8·90	8·80	9·05	9·58	8·85	9·15	9·00	8·88
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

The various milks were all treated alike, the separator being set before commencing, and thoroughly washed out between each separation, each lot being heated to 90° Fahr.

The milks of Wednesday were separated that evening, the creams being locked up in the special dairy-room for use on Friday morning. The milks of Thursday morning were separated directly they were brought in from the cows and the creams were churned at once.

Although the question of quality of morning's and evening's milk was not the subject of the trials, yet, as this has been before the public lately in connection with a fixed standard for milk, the following Table, showing the number of pounds of milk morning and evening required to produce 1 lb. of cream, may be found of interest—the cattle being milked at intervals of ten and fourteen hours:—

NUMBER OF POUNDS OF MILK REQUIRED TO MAKE  
1 LB. OF CREAM.

	Morning Milk.	Evening Milk.
	lbs.	lbs.
Shorthorn .. ..	5·20	4·06
Jersey .. ..	4·25	3·06
Guernsey .. ..	4·47	3·41
Kerry .. ..	4·41	3·17

Each of the creams was divided into four different lots of 9 lbs., to allow of four churnings of sweet and four churnings of ripened cream, at different temperatures.

The temperatures to which the creams and churns were brought were as follows:—

No. 1 at 54° Fahr.

No. 2 at 54° Fahr., adding hot water at 75° Fahr. when the butter was on the point of coming.

No. 3 at 58° Fahr.

No. 4 at 62° Fahr.

54° Fahr.—In most of the books this figure is given as the lowest temperature at which sweet cream need be churned.

54° Fahr. with hot water.—In the butter-test trials dealing with cream from milk twenty-four and twelve hours old, the addition of hot water has in many cases apparently obviated the necessity of a second churning, and so increased the weight of butter in the first churning.

58° Fahr.—For ordinary churning this figure is generally recommended.

62° Fahr.—In hot weather, when ice is not obtainable, cream may have to be churned at this high temperature.

The temperature of the atmosphere during the trials varied from 57° to 66° Fahr.

In each case, after the butter had come, the buttermilk was retained, allowed to stand a short time, and then passed through a separator and re-churned, the butter so obtained being weighed.

The buttermilks were all churned at the same temperature, viz., 54° Fahr.

The buttermilk of No. 4 Jersey sweet cream was not churned a second time as, owing to an accident, it was lost.

The next Table gives the average of the four churnings:—

NUMBER OF POUNDS OF CREAM REQUIRED TO MAKE  
1 LB. OF BUTTER.

	From Morning Milk.	From Evening Milk.
	lbs.	lbs.
Shorthorn .. .. .	6.42	6.26
Jersey .. .. .	4.25	4.54
Guernsey .. .. .	5.83	4.12
Kerry .. .. .	5.83	6.40

If the figures in the Table giving the number of pounds of milk required to make 1 lb. of cream are multiplied by the

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figures in the Table above, the butter ratio, that is to say, the number of pounds of milk required to make 1 lb. of butter, can be calculated.

The following Table gives this ratio, and the average ratios obtained compared with the average butter ratios of the cattle tested in the butter-test trials of the 25th May (the milk of the 24th May being churned on that day):—

## CALCULATED NUMBER OF POUNDS OF MILK REQUIRED TO MAKE 1 LB. OF BUTTER.

—	Morning Milk.	Evening Milk.
	lbs.	lbs.
Shorthorn .. .. .	33·38	25·41
Jersey .. .. .	18·06	13·89
Guernsey .. .. .	26·06	14·04
Kerry .. .. .	25·71	20·28

## NUMBER OF POUNDS OF MILK REQUIRED TO MAKE 1 LB. OF BUTTER.

—	In Churnability Trials.	—	In Butter Test Trials.
	lbs.		lbs.
Shorthorn .. .. .	29·39	6 Shorthorns .. ..	29·40
Jersey .. .. .	16·40	28 Jerseys .. ..	17·53
Guernsey .. .. .	20·54	5 Guerneys .. ..	22·42
Kerry .. .. .	22·99	Not tested.	

The creams and buttermilks were all tested for acidity and butter-fat by Miss La Mothe with the following results:—

## ACIDITY OF CREAM.

—	Morning Milk.	Evening Milk.
	Sweet Cream.	Ripened Cream.
Shorthorn .. .. .	·21	·41
Jersey .. .. .	·20	·37
Guernsey .. .. .	·20	·30
Kerry .. .. .	{ ·23—12 hours } { ·20— 3 hours }	·29

**BUTTER-FAT IN BUTTERMILK.  
AVERAGES OF THE FOUR CHURNINGS.**

				Morning Milk.	Evening Milk.
				Sweet Cream.	Ripened Cream.
Shorthorn	..	..	..	·37	·4
Jersey	..	..	..	·26	·27
Guernsey	..	..	..	·41	·27
Kerry	..	..	..	·22	·45

A few words of explanation may be necessary to make clear the next Tables, which give details in full of the churnability trials:—

Column No. 1 gives the weight of milk used.

Column No. 2 gives the quantity of cream obtained from the milk.

Column No. 3 gives the number of pounds of milk required to make 1 lb. of cream.

Column No. 4 gives the number of pounds of cream used for each test.

Column No. 5 gives the number of pounds of milk used for each test. (These figures are obtained by multiplying the figures in column 3 by those in column 4.)

Column No. 6 gives the percentage of fat as found in the milk by Dr. Voelcker.

Column No. 7 gives the number of pounds of fat in the milk used. (These figures are obtained by multiplying the figures in column 5 by those in column 6.)

Column No. 8 gives the calculated equivalent of butter. (These figures are got at by adding 14 per cent. for water and other constituents to the butter-fat found by the analyst.)

Column No. 9 gives the same figures reduced to pounds and ounces.

Column No. 10 gives the number of each test.

Column No. 11 gives the temperature of the cream and churn of each test.

Column No. 12 gives the weight of butter from the first churning.

Column No. 13 gives the difference, that is, loss between the weight of butter churned, as shown in

## SHORTHORN.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Weight of Milk.	Yield of Cream.	No. of lbs. of Milk to make 1 lb. of Cream.	Cream used.	Equal to Milk.	Percentage of Fat in Milk. (Voelcker).	Lbs. of Fat in Milk taken.	Equal to Butter with 98 per cent. Fat.	Reduced to Butter in lbs. and ozs.	No. of Test.	Temperature of Cream and Churn.	Yield of Butter from 1st Churning.	Butter lost.	Butter regained from Buttermilk.	Total Butter obtained.	Total Butter lost.
lbs. ozs. lbs. ozs.	lbs.	lbs.	lbs.	lbs.	per cent.	lbs.	lbs.	lbs. ozs.		°Fahr.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
UNRIPENED CREAM FROM MORNING MILK.															
245 6	48 6	5·20	9	46·8	3·00	1·4	1·63	1 10	1	54	0 13	0 13	0 9½	1 6½	0 3½
									2	54 h.w.	0 12	0 14	0 10½	1 6½	0 3½
									3	58	0 9½	1 0½	0 13½	1 7½	0 2½
									4	62	0 8	1 2	0 14	1 6	0 4
								1 10		Average	0 10½	0 15½	0 11½	1 6½	0 3½
RIPENED CREAM FROM EVENING MILK.															
187 8	46 2	4·06	9	36·54	3·85	1·4	1·63	1 10	1	54	1 6½	0 3½	..	1 6½	0 3½
									2	54 h.w.	1 5½	0 4½	0 0½	1 6½	0 3½
									3	58	1 6	0 4	0 0½	1 6½	0 3½
									4	62	1 3½	0 6½	0 4½	1 8½	0 1½
								1 10		Average	1 5½	0 4½	0 1½	1 7	0 8

JERSEY.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16							
Weight of Milk.	Yield of Cream.	No. of lbs. of Milk to make 1 lb. of Cream.	Cream used.	Equal to Milk.	Percentage of Fat in Milk. (Voelcker).	Lbs. of Fat in Milk taken.	Equal to Butter with 86 per cent. Fat.	Reduced to Butter in lbs. and ozs.	No. of Test.	Tempera- ture of Cream and Churn.	Yield of Butter from 1st Churning.	Butter lost.	Butter regained from Buttermilk.	Total Butter obtained.	Total Butter lost.							
lbs. ozs. lbs. ozs.	lbs. ozs.	lbs.	lbs.	lbs.	per cent.	lbs.	lbs.	lbs. ozs.		°Fahr.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.							
UNRIPENED CREAM FROM MORNING MILK																						
337	6	79	4	4	25	9	38.25	4.45	1.7	2.0	2	0	1	54	1 13	0 3	0 5	2 2	2 13	2 13	lost	
									2	54 h.w.	1 11 1/2	0 4 3/4	0 6 1/2	2 1 1/2								
									3	58	1 10	0 6	0 7 1/2	2 1 1/2								
									4	62	1 8	0 8	lost									
										Average of 4	1 10 9/16	0	5 1/8									
										Average of 3	1 11 1/2	0	4 1/2	0 6 1/2	2 1 1/2							
RIPENED CREAM FROM EVENING MILK.																						
204	8	66	12	3	06	9	27.54	6.97	1.75	2.04	2	1	1	54	1 13 1/2	0 3 1/2	..	1 13 1/2	0 3 1/2	0 2 1/2	0 2	
										54 h.w.	1 14 1/2	0 2 1/2	..	1 14 1/2								
									3	58	1 15	0 2	..	1 15	0 2							
									4	62	2 4 1/2	..	..	2 4 1/2								
										Average	1 15 1/2	0 2	..	1 15 1/2	0 2							

## GUERNSEY.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Weight of Milk.	Yield of Cream.	No. of lbs. of Milk to make 1 lb. of Cream.	Cream used.	Equal to Milk.	Percentage of Fat in Milk (Voelcker).	Lbs. of Fat in Milk taken.	Equal to Butter with 88 per cent. Fat.	Reduced to Butter in lbs. and ozs.	No. of Test.	Temperature of Cream and Churn.	Yield of Butter from 1st Churning.	Butter lost.	Butter regained from Buttermilk.	Total Butter obtained.	Total Butter lost.
lbs. ozs.	lbs. ozs.	lbs.	lbs.	lbs.	per cent.	lbs.	lbs.	lbs. ozs.		°Fahr.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
UNRIPENED CREAM FROM MORNING MILK.															
220 14	49 6	4 47	9	40 23	4 55	1 87	2 17	2 3	1	54	1 2½	1 0½	0 6½	1 9½	0 9½
									2	54 h.w.	1 1½	1 1½	0 7½	1 9½	0 9½
									3	58	0 15½	1 3½	0 7½	1 7½	0 11½
									4	62	0 14	1 5	0 10½	1 8½	0 10½
										Average	1 0½	1 2½	0 8½	1 8½	0 10½
RIPENED CREAM FROM EVENING MILK.															
139 4	40 12	3 41	9	30 69	6 85	2 10	2 44	2 7	1	54	2 5½	0 1½	..	2 5½	0 1½
									2	54 h.w.	2 5	0 2	..	2 5	0 2
									3	58	2 8½	0 3½	0 1	2 4½	0 2½
									4	62	1 12½	0 10½	0 1½	1 14	0 9
										Average	2 2½	0 4½	0 0½	2 3½	0 3½

KERRY AND DEXTER.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Weight of Milk.	Yield of Cream.	No. of lbs. of Milk to make 1 lb. of Cream.	Cream Equal to Milk.	Percentage of Fat in Milk (Voelcker).	Lbs. of Fat in Milk taken.	Equal to Better with 88 per cent. Fat.	Reduced to Butter in lbs. and ozs.	No. of Test.	Temperature of Cream and Churn.	Yield of Butter from 1st Churning.	Butter lost.	Butter regained from Buttermilk.	Total Butter obtained.	Total Butter lost.	
lbs. ozs.	lbs. ozs.	lbs.	lbs.	per cent.	lbs.	lbs.	lbs. ozs.		°Fahr.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	
UNRIPENED CREAM FROM MORNING MILK.															
139 1	31 8	4 41	9	39.69	3.95	1.57	1 13	1	54	1 1	0 12	0 84	1 94	0 34	
								2	54 h.w.	1 34	0 94	0 54	1 9	0 4	
								3	58	1 04	0 124	0 84	1 84	0 44	
								4	62	0 134	0 154	0 10	1 74	0 54	
							1 13		Average	1 04	0 124	0 84	1 84	0 44	
RIPENED CREAM FROM EVENING MILK.*															
233 14	73 12	3 17	9	28.53	4.90	1.40	1 10	1	54	1 64	0 34	..	1 64	0 34	
								2	54 h.w.	1 54	0 44	..	1 54	0 44	
								3	58	1 64	0 34	..	1 64	0 34	
								4	62	1 44	0 54	0 24	1 7	0 3	
							1 10		Average	1 54	0 44	0 04	1 64	0 34	

\* 3 morning and 4 evening milk, see Report.

column 12, and the calculated amount, as shown in column 9.

Column No. 14 gives the butter obtained from the butter-milk.

Column No. 15 gives the total weight of butter obtained from the two churnings.

Column No. 16 gives the difference, that is, loss between the weights of butter obtained from the two churnings and the amount calculated, as shown in column 9.

(See pages 114–117.)

From the foregoing figures it will be seen—

First, that the sweet creams in every instance churn badly, the loss being most marked in the Shorthorns, and next in the Guernseys.

Second, that, in nearly all cases, the lower the temperature of churning the less the butter subsequently made from the butter-milk.

Third, that the addition of hot water did not increase the yield of butter.

Turning to the various breeds, and calculating the butter that should be made from the milk according to the analysis which appears in the 9th column of the Table exhibited above, it will be noticed that the Shorthorns apparently yield milk from which barely one-half the butter can be obtained when the cream is unripened, while from the ripened cream they show a loss of over 17 per cent. of butter.

The Jerseys show a loss on unripened cream of about 20 per cent., while in ripened cream they approximately yield the calculated quantity of butter.

The Guernseys lose nearly as much as the Shorthorns from the unripened cream, while with the ripened cream they show nearly a loss of 12 per cent. of butter.

The Kerries churn better than the Shorthorns, but the loss in churning the unripened cream in their case is nearly 40 per cent., while with ripened cream their loss is about 16 per cent.

Three trials were practically undertaken at the Croydon Show, two, the subject of this Report, being of milks of four breeds at intervals of three and thirty-nine hours after milking, while the butter-test trials were from the mixed milks morning and evening of individual cows at an average of about eighteen hours from the time of milking, so that sweet cream, cream that had been standing eighteen hours and thirty-nine hours respectively, were churned.

In the butter-test trials there were only four cases where butter was obtained from the second churning of the buttermilks.

No. 1. Jersey	. . .	1½	ozs. of butter.
No. 2. Jersey	. . .	1¾	„
No. 3. Guernsey	. . .	¾	„
No. 4. Shorthorn	. . .	6	„

From this it would appear either that the longer ripening of the cream, or the lower temperature at which the butter-test trials were carried out, may account for the superior churnability of the various lots.

From the three trials the following conclusions may be drawn:—

(a) That the churning of perfectly sweet cream results in considerable loss.

(b) That cream after being kept twelve or twenty-four hours and then mixed, although sweet to the taste, has undergone such a change that the same loss as in churning sweet cream does not result.

(c) That the creams from cattle which are credited with large and regular-sized fat globules churn better than those which contain small and irregular-sized ones in both the sweet and the ripened stages, showing that the former are the most economical breeds for butter production.

(d) That in testing individual cows for weight of butter procurable the temperatures of the cream and churn should be accurately taken, and the buttermilks kept to see if any cream still remains in them.

(e) That the percentage of fat shown in a chemical analysis of milk is not a reliable guide to the weight of butter to be obtained.

In conclusion, a word of thanks is due to the workers who assisted me in carrying out these trials, especially to the Stewards, the Rev. A. T. Boscawen and Mr. A. F. Somerville, and to Miss Jenkins, the Dairy Instructress of the Staffordshire County Council.

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XI.—*Payment for Milk according to Analysis as Practised in Belgium.* By G. E. LLOYD-BAKER.

IN the following paper I have combined an account of a system suggested by Baron Peers (well known for his experiments on ensilage) in 1897, with a bulletin issued by the Minister of Agriculture in Belgium, in which Dr. M. Henseval gives the results of experiments on Baron Peers' system.

The first point to which Baron Peers drew attention was, that the fat in milk varies not only in quantity but in quality.

Dr. Gerber's method of analysis while excellent for determining the first, does not effect the second; and this may lead to serious injustice in the purchase of milk by co-operative dairies, for the quality, as well as the quantity, of the butter extracted should be taken into account.

Every dairyman knows that two milks which contain the same quantity of fat will not always yield the same quantity of cream to the separator nor of butter to the churn. There are active milks, whose cream separates easily, and others, which we may call lazy milks, whose cream takes much longer to extract; the quantity of fat in the skim milks also differs considerably. It is not fair, therefore, to pay for each of these milks according to the fat that it contains; payment should be made according to what is extracted; and the quality of the fat should also be taken into consideration, for the better butter will naturally sell at a higher price.

For instance:—There are two farmers, A. who has one cow, B. who has several, supplying a factory. As A.'s cow gets near calving the fat in the milk increases. B.'s cows calve at different times, and, as the milk is mixed, the variation is not so great. The first may show by Gerber 4·2 per cent., the second 3·5 per cent. Now if payment is made according to these figures a flagrant injustice is committed; for it is well known that the butter from a cow that is near her calving time is ill-flavoured and scarcely saleable. Practice has, however, enabled us to find a method of paying for milk according to both the quantity and the quality of the butter produced, which, if not perfect, at any rate, satisfies the parties concerned. This method is based on the fact that milk which can be creamed most completely and most rapidly in the separator is also that which yields the best butter. Therefore, centrifugal power ought to be used to determine the price which should be paid for milk bought for butter-making.

The Alexandra tester shows clearly whether a milk can be separated quickly, moderately quickly, or slowly; in other words,

whether the butter from that milk will be very fine, fine, or inferior. Thus it shows at the same time the quality as well as the quantity of the butter that can be extracted from the milk.

The Baron concludes his remarks with a statement, the importance of which will be appreciated. He says:—"In my butter factory, it is of the utmost importance to possess the confidence of all the co-operating members. If I had abandoned the Alexandra tester all the large farmers would have withdrawn, because their interests would have been sacrificed by the employment of the Gerber tester alone. Their milk makes better butter than milk containing the same amount of fat, but from a farmer with one or two cows only. This the Gerber would not have shown.

"I have thought it my duty to warn the organisers of co-operative dairies against this danger. I would insist upon the combined use of the Gerber apparatus and the Alexandra tester; together these ought to solve all difficulties. The very existence of co-operation necessitates, above all things, that the co-operators should be assured of the work being carried on with absolute fairness and equity. On this condition alone can co-operation be established on a solid and durable foundation, and commend itself to agriculturists large and small, with the certainty of not being unfair to any interest or arousing any mistrust."

I now pass to the paper of Dr. Henseval, and to the scheme of payment in use at the butter factory at Oostcamp.

The Alexandra turbine is arranged to receive a disc in which small tubes are placed; these are simple graduated cremometers. The tubes are filled with milk up to 0 of the scale. They are submitted to centrifugal force in the disc, which turns with a speed of 3,500 revolutions per minute, and are revolved about 10,000 turns, or for three minutes. After this the tubes are taken out and the percentage of cream thrown up is read. The tubes are then submitted to 10,000 more turns, and again read, and those which were completely separated at the first reading are put on one side. This is done a third and fourth time if necessary. The milk can now be divided into two chief classes—the active, in which the cream rises rapidly, and the lazy, in which it rises slowly.

For those milks which are separated at the first trial 0·8 is added to the percentage of cream shown. For the second series the figures are left alone; from the third series 0·8 is subtracted; and from the fourth series 1·6 is subtracted.

A slight correction must be made according to the thickness of the cream. If it is liquid enough to move easily when the tube is inclined, 0·6 instead of 0·8 must be added. If it is not clearly separated, and is not thick, 1·0 instead of 0·8

must be deducted, and so on, according to the indications which a little practice will enable one to follow. If you ask how this scale of corrections is arrived at, it must be admitted that it is not absolute, but that it is the result of practical experience.

In practice it is found that these corrections always correspond with some circumstance which affects the quality of the milk. Thus, when the cows are turned out to grass, the milk rises in value. In winter, the milk, which has to be reduced in price, comes from cattle fed on pulped beetroot, from which the sugar has been extracted, turnips, &c., or from cows near calving. Agriculturists know well that all these circumstances affect the quality of milk.

I may here remark that ensilage has an excellent effect upon the milk. Baron Peers' experiments with respect to this are very interesting and instructive.

A Commission, with Baron Peers at its head, was authorised to try experiments at the butter factory at Oostcamp, with a view to finding out whether the quality of the butter corresponded with that of the milk in such a degree as to justify the proposed scale of payment.

The experiment was made with five types of milk as follows:—

1. Milk B.P. Mixture of three parts Flanders milk with one part Jersey.
2. Ca. Pure Jersey.
3. A. Active milk.
4. B. Lazy milk.
5. M. Mixture of the above-named four milks in equal proportions.

Two sets of experiments were carried out.

1. The whole milk was ripened and churned. Twenty-eight pounds of each of these milks were set to ripen naturally for forty-eight hours, at 14° Réaumur (63·5° Fahr.), in pans covered with muslin, and then churned. Two points were specially observed, namely, the quantity and the quality of the butter obtained.

2. The cream from these milks was ripened and churned. The cream was separated in a "Germania" hand separator, worked at its maximum output of 20 gallons per hour. The milk had been heated to about 30° Réaumur. The cream was mixed with 5 per cent of buttermilk, and set to ripen at 14° in pots covered with muslin.

The churning was done in a double churn of the Victoria type. B.P. was churned with Ca., A. with B., M. by itself.

The work was conducted on the basis of the following analyses:—

- |                                        |                                                                                                                      |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 1. Examination of milk .. ..           | Density, according to the Westphalia balance.<br>Acidity.<br>Richness in fat (Gerber).<br>Cream by Alexandra tester. |
| 2. Cream .. ..                         | Quantity of fat (Gerber) in a given weight of cream.<br>Acidity before churning of a given weight of cream.          |
| 3. Skim milk .. ..                     | Density, according to the Westphalia balance.<br>Quantity of fat (Gerber).                                           |
| 4. Butter milk .. ..                   | Quantity of fat (Gerber).                                                                                            |
| 5. Chemical Analysis of the butters .. | Water.<br>Fatty matter.<br>Matters insoluble in ether.                                                               |

The temperature, the time of churning, and the quantity of butter obtained were carefully noted. These experiments were repeated with only a few variations of detail. B.P. was churned alone, Ca. with M., A. alone. During churning it was necessary sometimes to raise the temperature by adding a little warm water.

The butters were carefully valued, and B.P., A., and Ca. gave butter far superior to B. The Alexandra tester showed that this superiority corresponded with the rapidity of separation of the cream. The butter from M. suffered from the presence of milk B. The Dairy Commission decided to continue the experiments, and requested Baron Peers and his coadjutors to repeat them. These experiments enabled them to put certain questions which, for practical purposes, we may state as follows:—

(a) Does the butter from A. (active milk) differ from that of B. (lazy milk)? In other words, is the milk A. of higher value than B. for dairy purposes?

(b) Can the creams A. and B. be mixed so as to produce a first-class butter; taking the percentage of fat as the only standard of value?

(c) Can the owner of the milk B. work it himself with advantage, or had he better deal with it on co-operative principles?

The two following experiments were made:—

1. Twenty-five pounds of whole milk of A., B., and M. (a mixture of A. and B. in equal proportions) were taken. Five per cent. of buttermilk from the dairy was added to each sample to ripen it, and it was put to stand in earthen jars, covered with muslin, for twenty-four hours at 15° Réaumur, and then at 24° for six hours. A. and B. were churned simultaneously in the double churn, M. was churned alone. The yield of butter and the quality were carefully noted.

2. The cream from these milks was churned when sweet, and notes were taken of the rate of creaming and of churning, and of the quantity and quality of the butter obtained.

Tests were made to ascertain the quantity of fat by Gerber in the whole milk, skim milk, and buttermilk. The cream was separated with the same machine as previously used—regulated to separate 18 gallons per hour. The milk was heated to 32°. The cream was left at a temperature of 24° without adding any ferment, and then cooled to 14° for churning. According to Gerber the milk showed the following figures:—A., 3·25; B., 4·01; C., 3·95; and the Alexandra tester gave much the same results. When churned whole, the butter obtained was in the ratio of A., 0·385; B., 0·450; M., 0·335. There was more fat left in the buttermilk of B. than of the others. Yet B. took longer to churn and required a higher temperature, and the cream did not smell so good. The butter from the ripened milk was judged by points for flavour, aroma, consistency, colour, texture, and freedom from buttermilk, making altogether 300 points,—A. showed 290, B. only 138, and M. 238. The butter made when the cream was churned, gave the same general results, but the figures were A., 290; B., 210; M., 264. The butter as it came from B. was brittle and short, and did not easily separate from the casein.

The following Table shows how the price of the milk, estimated according to the methods of Baron Peers and of Gerber respectively, vary.

According to Baron Peers—

Co-efficient of the Dairy in January 1·39 centimes (4,248,620 degrees, being valued at 59,652 francs). The price of butter was 3 frs. 10 c. the kilogramme.

Milk A. 60 × 9·4* = 564	A. 564 × 1·39 = 7·84 frs.
„ B. 60 × 8·4* = 504	B. 504 × 1·39 = 7·00 „
„ M. 60 × 8·8* = 528	M. 528 × 1·39 = 7·34 „

According to Gerber—

Milk				Butter obtained.
A.	60 × 3·25 = 195	..	..	2·285 kilo.
„ B.	60 × 4·1 = 246	..	..	2·670 „
„ M.	60 × 3·95 = 237	..	..	2·450 „
	678			7·405

The butter was sold at 3 frs. 10 c. the kilogramme.

\* These figures are obtained as follows:—

As milk A. showed 8·6% cream after 10,000 revolutions it was raised to 9·4	
„ B. „ 11·4 „ only „ 40,000 „ „ lowered „ 8·4	
„ C. „ 9·4 „ „ „ 20,000 „ „ „ „ 8·8	

$$7 \cdot 405 \times 3 \cdot 10 = 22 \text{ frs. } 95 \text{ c.} \quad \text{Co-efficient } \frac{2295}{678} = 3 \cdot 38 \text{ centimes.}$$

$$\text{Milk A. } 195 \times 3 \cdot 38 = 6 \cdot 59 \text{ frs.}$$

$$\text{„ B. } 246 \times 3 \cdot 38 = 8 \cdot 31 \text{ „}$$

$$\text{„ M. } 237 \times 3 \cdot 38 = 8 \cdot 01 \text{ „}$$

Price of a kilogramme of milk by the two methods—

	Baron Peers.				Gerber.
Milk A.	0·130 fr.	..	..	..	0·109 fr.
„ B.	0·116 „	..	..	..	0·138 „
„ M.	0·122 „	..	..	..	0·133 „

1. The butters from A. and B. were of strikingly different quality; A. was superior to B. in flavour, aroma, colour, and texture.

2. The milk B. alters the quality of the butter in exact proportion to the quantity used. The owners of milk B. will always gain by working in co-operation.

3. These facts being proved, it is evident that they ought to be taken into account in the payment for milk.

I have given the above results in Belgian weights and money. The calculations are so minute that I feared, by translating them into English weights and money, their accuracy might be affected.

Baron Peers intends to continue his experiments, both for testing the value of milk, and for improving the quality of butter.

## XII.—*A Note on the Fat Globules in Milk.*

By FRED. J. LLOYD, F.C.S., F.I.C.

THE Tring Agricultural Show has become well known, and especially the butter tests which for several years have been carried out there by Mr. Ernest Mathews. In 1900, and again in 1901, I was asked by Mr. Richardson Carr to test some of the samples of milk for butter-fat. Mr. Mathews had noticed, not only at Tring but at other Shows, that while the amount of butter made and the amount of fat found in the milk by chemical analysis in some instances agreed admirably, in others they did not agree at all. Chemical analysis frequently showed more butter-fat to be present in the milk than was recoverable by the churn as butter. Why was this? Mr. Ernest Mathews, instead of jumping to the conclusion which several writers in the Press have done, that chemical analysis must therefore be

wrong, argued that the fat might be lost either in the separated milk or in the buttermilk. Upon re-separating and re-churning the buttermilk he demonstrated, some years ago at the Dairy Show, that in several instances some ounces of fat could be thus recovered from the buttermilk, and that, when these were added to the butter yield, chemical analysis and practical results very closely agreed. The problem, however, still remained, why should some of the fat be readily churnable and some not? It had been noticed that the tendency to yield all its fat as butter was greater in the milk from Jersey cattle than in that from other breeds. Mr. Mathews, therefore, on hearing I was going to Tring, asked me to take a microscope and examine the milks for the size of the fat globules. I accordingly did so, and the results obtained may prove of interest.

A few words as to the method of procedure may not be out of place. To see the fat globules well, it is generally desirable to dilute the substance you are examining with water. A small drop of milk or cream is taken on the end of a clean glass rod and the microscope slip is just touched with it. With another clean glass rod a drop of water is taken, and the two are carefully mixed together. Care must be taken not to churn or break the fat globules. Before putting on a cover glass, place on the slip, close to the drop of liquid, a little triangular piece of ordinary writing paper. Now put on the cover glass, allowing one edge to rest on the paper the other on the slip. You will then have underneath the cover glass a wedge-shaped layer of liquid, exceedingly thin at one end and comparatively thick at the other. The advantage of this method is that the fat globules will not be crushed by the weight of the cover glass, and you can observe them either crowded together at the thick end, or floating separately in the thinnest portions of the liquid layer. If the fat globules are to be measured, it is necessary to use a micrometer eye-piece, that is, one showing a scale, and the value of this scale must be accurately determined beforehand. I have used an excellent  $\frac{1}{8}$ -inch obj. by Swift, an 8 or 12 compensating eye-piece by Zeiss, and my microscope so adjusted that each division of the micrometer scale represented  $\frac{1}{300}$  part of a millimeter. Let us try and realise what that is. If an eighth of an inch be divided into three parts, each will be very nearly 1 millimeter, and a small fat globule will need to be magnified 500 times to appear 1 millimeter in diameter, while a very large fat globule will appear about 10 millimeters in diameter. The standard of measurement for minute objects is  $\frac{1}{1000}$  part of a millimeter, and is called a "micron"; it is designated by the Greek letter  $\mu$ .

Nearly everyone talks glibly of the *large* fat globules present in Jersey milk, so I determined to examine some Jersey milk first, in order to determine whether the microscope as arranged would give satisfactory results. The taking of the samples for analysis with the Babcock machine had occupied some time, so that the milks had been standing a few hours before the microscopical examination could be made. It was therefore decided to examine only the cream, which ought to contain all the large fat globules, and subsequently to examine the skim milk.

Contrary to expectations, no exceptionally large fat globules could be found in either of three samples of Jersey milk examined. One or two were found of  $\frac{20}{1000}$  mm. in diameter, and several of  $\frac{18}{1000}$  mm., while the majority were evidently between 8 and 12  $\mu$ , while only few were less than 4  $\mu$ . That the vast majority of the globules were of *very similar size*, about 10  $\mu$  in diameter, was the most striking feature observable, while larger and smaller globules were evidently exceptions.

The fat globules in Shorthorn milk were next examined, and the results obtained were as follows:—

Largest globules	..	..	..	..	14 $\mu$
Average and majority	..	..	..	..	6-8 $\mu$
Small, numerous	..	..	..	..	1-2 $\mu$

Here, again, it was evident that the majority of the larger globules were all about one size, that very large globules were exceptional, but that small globules were very numerous.

An Ayreshire gave the following results:—

Largest globules	..	..	..	..	10 $\mu$
Average large	..	..	..	..	6 $\mu$
Small ..	..	..	..	..	2 $\mu$

A cross-bred:—

Largest	..	..	..	..	10 $\mu$
Majority	..	..	..	..	4-6 $\mu$
Many ..	..	..	..	..	1-2 $\mu$

"The unexpected happens," and a surprise was in store for me and for those who were watching the work with interest. As the analysis of one of the milks had shown less than 2 per cent. of fat, it was determined to examine the fat globules in this sample. Instead of finding these exceptionately small, as was at first expected, they were found to be exceptionately large. When taking the sample, I remarked to Mr. Mathews: "How rapidly this milk has thrown up its fat; one would think the analysis must be wrong." But the microscope

revealed the cause. The fat globules were exceptionally large, the following being the measurements:—

Largest globules, very numerous	..	..	20-24 $\mu$
Majority	..	..	10-14 $\mu$
Smallest, some few only	..	..	1-2 $\mu$

This cow was a Shorthorn, and the globules were certainly as large, if not larger, than any I have ever found in Jersey milk. There were, however, comparatively few globules of fat in the cream from this sample compared with the same volume of cream from any other milk.

The general result of these observations was to show—

(a) That the presence of exceptionally large fat globules in milk is rare.

(b) That the most striking feature about every sample was the uniformity in size of the majority of the fat globules.

(c) That while some milks contained uniformly large globules, say  $\frac{1}{1000}$  of a millimeter in diameter, others contained uniformly smaller globules of about  $\frac{1}{1000}$ ,  $\frac{1}{1000}$ , or  $\frac{1}{1000}$  of a millimeter in diameter.

(d) That in some samples, more especially the Jersey milks, the globules appear to have a narrow range of size, in others, such as in Shorthorn milk, the range is considerable, it being scarcely possible to measure the finest globules, without much higher magnification.

Evidence of the absence of a skin or covering to the fat globules, which is, in my opinion, as conclusive as any evidence yet put forward in support of the "envelope" theory, was by accident obtained.

Owing to the heat, the mere mixing of the cream with water caused the fat to partly lose its globular condition and take on a granular form. The globules were, so to speak, "broken." Now, when yeast is so broken it is easy to distinguish the cell wall or envelope from the contents. But with broken butter-fat globules no cell wall or envelope whatever can be discovered, and, for the simple reason, in my opinion, that it does not exist.

Some skim milks were next examined, and here, again, evidence was afforded of the comparative absence of very small globules in the skimmed milk of Jerseys, and their presence in abundance in the skimmed milk of Shorthorns.

On returning to town the following experiment was made. Shorthorn milk was set in a vessel so that I had a column of milk 15 inches high, so arranged that the milk could be drawn off from below. After standing twelve hours, the fat globules in the bottom portion of the column were examined, then those

in a portion drawn from 5 inches up, then those from 10 inches up, and, lastly, from the cream at the top.

The results obtained are interesting and as follows:—

#### SIZE OF FAT GLOBULES.

—	At bottom.	5 in. up.	10 in. up.	Top.
Largest.. ..	$\frac{4}{1000}$	$\frac{8}{1000}$ and $\frac{7}{1000}$	$\frac{10}{1000}$ , $\frac{10}{1000}$ and $\frac{8}{1000}$	$\frac{10}{1000}$
Smallest .. under	$\frac{1}{1000}$	$\frac{2}{1000}$	$\frac{1}{1000}$	$\frac{1}{1000}$

This experiment was subsequently repeated with another sample, this time of Jersey milk. The tube was much wider, and the portions were drawn off in 1-inch layers from the bottom. The results were as follows:—

Lowest layer.—The largest fat globules visible are only slightly over  $\frac{4}{1000}$  mm. The smallest are under  $\frac{2}{1000}$  mm. The greatest uniformity is among those of  $\frac{4}{1000}$  mm.

2nd layer.—The majority are  $\frac{6}{1000}$  mm. I cannot find one  $\frac{8}{1000}$  mm.

3rd layer.—Again the majority are 6 to 7  $\mu$ , but there are many  $\frac{8}{1000}$  mm.

4th layer.—Globules of  $\frac{8}{1000}$  mm. are more numerous, some few  $\frac{9}{1000}$  mm., none 10  $\mu$  to be seen.

5th, cream layer.—The largest fat globules are  $\frac{24}{1000}$  mm., the majority 8 to 10  $\mu$ .

What had taken place here? When the milk was set the fat globules were equally distributed throughout the whole mass. Twelve hours after, no globule larger than  $\frac{4}{1000}$  of a millimeter could be found in the bottom portion. Hence we may assume that all globules larger than this had gradually risen. It is equally evident from the results that the larger the globule above the  $\frac{4}{1000}$  mm. the higher it had risen in a given time. In the globules smaller than  $\frac{4}{1000}$  of a millimeter there appeared to have been no movement at all, but that all such globules had remained suspended in the milk just as when set. This alone would account for the finding, at every height examined, of minute fat globules as small as those in the lowest layer, though somewhat less noticeable, being crowded out by the increased proportion of large globules. No movement seemed to have taken place in these minute fat globules, and this would account for the fact that no setting system has ever permitted all the fat to be removed as cream. Even the mechanical separator does not appear to

exercise sufficient power to prevent the smallest fat globules from remaining practically stationary in the skimmed milk. If the enormous power of a separator fails to overcome this tendency, is it not equally probable that the comparatively small force exerted in churning also fails to collect them? These observations lead me to think that the unchurnability of fat in certain milk is intimately associated with, if not due to, the size of the fat globules. All the milk examined contained the minute fat globules. The chief difference between the various milks seemed to lie rather in the proportion of the small globules present.

The absence at times of the usual proportion of minute fat globules from the milk of Shorthorns, may account for these animals yielding more churnable fat than others. But only further observation can prove this.

In these few experiments I was not able to find any confirmation of the theory that the large fat globules carry up smaller globules with them into the cream. All the fat globules appear distinct, and I could not discover any attraction between them. Even in the thick cream the very large fat globules are not surrounded with minute globules.

The whole subject is one well worthy of further study, which should aim at determining the effects of breed, feed, time between milkings, and time since calving, on the size of the fat globules, and then the influence of their size upon the production and churnability of cream.

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### XIII.—*Note on the Three Preceding Articles.*

By the ASSOCIATE EDITOR.

The credit of first pointing out the relative churnability of different milks, or creams, rests with Mr. Mathews. He was led to this observation by working on the milk of individual cows. Baron Peers, working with the mixed milk from herds of cows, notices the same result. Hence there can be no doubt that we have here a fact of no small importance to butter-makers. The cause of this peculiarity now has to be discovered. Mr. Mathews noticed that it was more marked in the milk of some breeds than in that of others. Thus, for example, Jersey milk is, as a rule, more churnable than Shorthorn milk. "Breed," therefore, seems to affect it. Baron Peers considers "food" and

"time since calving" affect it. Hence it would appear to be brought about by several secondary causes. But what is the primary cause? My examination of the fat globules would at least point to the possibility of that being one cause, if not the sole cause, and this is supported by the contention of Baron Peers, that the cream volume obtained under definite conditions is a true guide to churnability, or butter-producing capacity. The subject needs investigation, and is one far from easy to investigate. The work hitherto done has been wanting in precision. There have been far too many "undetermined quantities" in the results. The utmost precision will alone enable a satisfactory answer to be obtained to this problem.

#### XIV.—*Experiments on Cider-Making. Report for 1901.*

By F. J. LLOYD, F.C.S.

THE season of 1901 was one of small rainfall, with high temperature, and during the months of April, May, and June of more than usual bright sunshine. Towards the end of the ripening season there was, however, less sunshine than there had been during the previous two years. The apples consequently ripened more slowly than had been expected, and the crop was not large. The following Table gives the principal data as regards the weather of 1901:—

TABLE SHOWING THE TEMPERATURE, RAINFALL, AND BRIGHT SUNSHINE RECORDED AT CULLOMPTON DURING THE SEVEN MONTHS APRIL TO OCTOBER, 1901.

MONTHS.	AIR TEMPERATURE.				RAINFALL.		
	Minima.	Maxima.	Min. and Max. combined.	Difference from Average.	Number of rainy days.	Total fall in Month.	Difference from Average.
	°F.	°F.	°F.	°F.		Inches.	Inches.
April .. ..	38·5	57·5	48·0	0·0	16	3·57	+1·19
May .. ..	43·7	65·8	54·8	+2·4	6	0·69	-1·44
June .. ..	48·6	66·8	57·7	-0·6	11	2·64	+0·44
July .. ..	54·1	74·2	64·2	+2·6	8	1·43	-1·47
August .. ..	50·9	70·9	60·9	+0·2	13	1·57	-1·32
September ..	50·2	65·7	58·0	+0·8	14	2·70	-0·46
October .. ..	42·3	58·1	50·2	+1·6	19	2·58	-1·33

MONTHS.	BRIGHT SUNSHINE.			
	No. of Hours recorded.	Difference from Average.	Percentage of possible Duration.	Difference from Average.
April .. .. .	191·6	+36·7	47	+ 9
May .. .. .	255·2	+51·9	53	+11
June .. .. .	188·9	-13·0	39	- 2
July .. .. .	200·0	+12·6	41	+ 3
August .. .. .	213·4	+29·1	48	+ 6
September .. .. .	114·2	-29·8	31	- 8
October .. .. .	80·8	-16·9	25	- 5

The total yield of the apples at Butleigh was about 6,000 gallons of juice.

The effect of the season on the apples will be noticed in some of the following Tables.

The apples on an average were not quite so small as last year, but individual varieties varied greatly in size as compared with former years, some being much smaller, others much larger. Our observations at Butleigh show that a particular season does not affect all varieties of apples alike.

The percentage of juice was high when working on the bulk—1,000 lbs. of apples yielding 690 lbs. of juice.

An experiment was made to determine whether by breaking down the cheese and re-pressing, sufficient juice could be obtained to justify the trouble.

From 1,850 lbs. of pomace, 1,277 lbs. of juice of specific gravity 1·057 were obtained in the first pressing.

After being broken down and re-pressed, the cheese yielded a further 137 lbs. of juice of specific gravity, 1·054. It will be noted that the second juice had not so high a gravity as the first.

The following Table gives the

AVERAGE COMPOSITION OF JUICE FROM PRESS.

Year.	No. of Samples.	Specific Gravity.	Solids.	Acid.
1893	6	1·060	14·40	·63
1894	11	1·050	11·14	·60
1895	13	1·052	12·24	·46
1896	5	1·057	14·02	·40
1897	5	1·053	13·26	·68
1898	5	1·056	13·62	·51
1899	14	1·061	15·57	·44
1900	54	1·059	..	..
1901	12	1·057	14·43	·34

It will be seen that while the specific gravity of the juice was not so high as in the two previous seasons, it was as high as it had been since 1893.

The most marked peculiarity of the juice was its low acidity.

This same point is brought out by a study of the composition of the four varieties of apples which have been analysed in previous years (see Table, page 134). It will be noticed that the apples vary each year—(I.) In average size or weight. (II.) In the proportion of juice which they yield. It is somewhat remarkable that this does not appear to depend upon the average size, for small apples will at times give a large, at other times a small, proportion of juice. (III.) In the gravity of the juice. Not invariably, but frequently, this appears to increase as the size of the apple decreases. On examining the constituents of the juice this season we note that while the acid, as previously mentioned, is low, the "extractives" are exceptionally high. It is highly probable that there may be some connection between these two constituents. One other characteristic is the high proportion of cane sugar. Why the composition of the apple is so greatly affected by the season is a problem which I have not yet attempted to investigate, but merely here point out some of the evidences of this effect. It is worthy of investigation, just as are the changes in composition due to locality, that is to say, due to soil as distinct from climatic conditions. Not that we can alter either the one or the other; but the more thoroughly we understand the processes of Nature, the more mastery we shall obtain over the products which are the results of such processes.

#### EARLY MADE CIDER.

To secure from the very first windfalls, and from the juice of the first cheeses, a beverage very slightly, if at all, inferior to the general make, is a result that but a few years ago would have been considered unattainable.

The first experiments to this end were started in 1899, and this year, guided by the experience then gained, still further progress has been made.

The great difficulty with early made cider is the rapidity with which the apple-juice ferments. To check this fermentation must be the primary consideration of the cider-maker. It can only be done by racking at the right moment. Having taken the specific gravity of the juice when placed in a barrel, write this down with chalk on the barrel. In the course of a week or so again test the gravity, and write this down with the

COMPOSITION OF THE JUICE OF VARIOUS APPLES.

Name of Apple.	No.	Average Weight.	Percentage of Juice.	Specific Gravity.	Solids.	Acid.	Grape Sugar.	Cane Sugar.	Tannin.	Extractives and Ash.	Grower.	District.
Kingston Black ..	1897	160	67	1.0606	14.86	.48	10.64	3.24	.126	.374	J. C. Waterman ..	Baltonsboro' S.
	1898	190	53	1.0691	16.90	.57	10.84	4.31	.182	.998	Do.	Do.
	1899	290	68	1.0667	16.64	.61	11.90	2.80	.110	1.220	Do.	Do.
	1901	298	60	1.0651	16.77	.41	10.26	5.12	.147	.588	Do.	Do.
Chisel Jersey ..	1897	163	58	1.0542	13.50	.31	11.11	1.71	.264	.103	R. W. Scott ..	Kingsbury S.
	1898	214	65	1.0542	13.46	.32	9.80	2.39	.244	.703	J. H. Symes ..	Martock S.
	1899	235	68	1.0611	15.68	.32	11.90	2.80	.174	.486	C. Osborne ..	Cadbury S.
	1901	231	57	1.0640	15.62	.20	9.09	2.01	.226	4.094	J. H. Symes ..	Martock S.
Red Jersey ..	1897	159	68	1.0596	14.50	.30	10.87	3.01	.124	.196	J. C. Waterman ..	Baltonsboro' S.
	1898	193	58	1.0611	14.98	.31	12.04	1.85	.314	.446	Do.	Do.
	1899	221	68	1.0667	16.76	.28	12.18	1.22	.230	2.850	R. Neville Grenville	Butleigh S.
	1901	304	60	1.0640	16.00	.12	9.80	4.49	.238	1.352	J. C. Waterman ..	Baltonsboro' S.
Butleigh No. 14 ..	1897	147	50	1.0790	20.24	.21	13.18	4.94	.300	1.610	R. Neville Grenville	Butleigh S.
	1898	174	50	1.0933	23.22	.40	18.18	2.22	.380	2.040	Do.	Do.
	1899	225	43	1.0925	24.32	.48	18.83	4.22	.206	.534	Do.	Do.
	1901	274	43	1.0811	20.48	.15	12.50	4.74	.168	2.922	Do.	Do.

S. Somerset.

date on the barrel. This must be done frequently. It will show the rate of fermentation, and indicate when each barrel should be racked. For example, this year when the specific gravity of the first extracted juice fell to 1·044 it was racked. When it had fallen to 1·037 it was again racked, and racked again for the third time on 5th November, when the gravity was 1·033.

The juice was filtered on the 9th January, because the gravity was then 1·022, so that the liquid contained 4 per cent. of alcohol, and as the cider was not intended for bottling, it was stored in casks well bunged down and placed on their sides, *not on end*. The necessity of always keeping the barrels in this position cannot be too often impressed upon cider-makers.

As an indication of the progress which this season's work represents, it may be interesting to compare the results with those obtained in the past.

In 1897, out of 50 barrels of cider made during the season, no record whatever was kept of the first 11. It was never expected to make out of these windfalls anything but cider for the farm, and cider for the farm was then more like vinegar than cider. In 1898, out of 70 barrels made, the first 12 were not attended to.

In 1899 I began to pay attention to this early made cider, but did not recognise its peculiarity to be rapid fermentation until too late to make much improvement that season; and, consequently, when filtered it had a gravity of only 1·007, which is too low to secure good cider. In 1900 a still further improvement was made, and the cider was filtered with an average gravity of 1·015, and while most of it was good, some was excellent. This year the whole of the first made cider is completely under control, and the filtration is postponed until each barrel is ready.

Thus it will be seen that the early made cider, which may be said to represent from 15 to 25 per cent. of the total output, according to the season, instead of being neglected and relegated to the farm hands as hitherto, has this season been converted into a beverage in no way inferior to the remainder of the output.

The principal reason for this neglect was the supposition that the early juice was of inferior quality. This I find to be quite an error. The specific gravity of the early juice this year was 1·059; the average of the season, 1·058.

#### FERMENTATION.

The rate of fermentation has been remarkably slow, slower than in any previous year, and consequently the whole of the

apples were ground and pressed before it was necessary to begin filtering even the first made cider. This is a great gain in the economy of cider-making. To what it is due cannot be said with certainty, partly, no doubt, to the fact that the commencement of cider-making is now delayed until as late in October as possible, also in part to the increased care in keeping the apples clean. Not that the apples are yet so clean as I could wish, but they are far cleaner than they were in the past.

But in the main this result is probably due to the extreme cold experienced during December. This seemed to check fermentation thoroughly, and even the subsequent warm weather of January failed to make amends for this check. How remarkably slow this fermentation has been may be best indicated by the following figures:—In the Report for 1900 it was pointed out that fermentation being rapid the gravity of the juice had fallen, per day,  $\cdot 0011$ . In 1899 fermentation was of average rate, and the gravity fell, per day,  $\cdot 0007$ . This year, at the time of writing, the average daily decrease in gravity has been only  $\cdot 00023$ , or one-third of the rate in 1899. These facts raise the question—Could not the conditions which Nature supplied this year be obtained artificially in cider factories?

#### BOTTLING.

In order to determine some of the questions which have to be answered regarding the time and condition of the cider for bottling, many experiments have been made. It is found that if bottled with a gravity of over  $1\cdot 025$ , the subsequent fermentation will cause some of the bottles to break, or else cause a considerable loss from leakage. Moreover in those bottles which do not break a large deposit is formed, which even if first allowed to settle has a tendency to rise in the cider when the bottle is opened, owing to the rapid evolution of gas, so that the liquid cannot be poured out clear.

In spite of this large deposit of material, the amount of alcoholic fermentation which has taken place is comparatively small. It has therefore been found desirable not to bottle until the cider contains at least 4 per cent. of alcohol by volume.

This is discovered by means of the Table which was published in my 1895 Report. For example, the average gravity of the juice this year has been  $1\cdot 058$ . It will not contain 4 per cent. of alcohol until the gravity has fallen to  $1\cdot 023$ , and it will then contain over 4 per cent. of sugar and be medium sweet cider.

After most careful consideration of all the factors, I have

come to the conclusion that no fixed gravity can be laid down as a standard for bottling. It must depend in a great measure on the quality of the original apple-juice. The gravity, however, must not be higher than 1.025, and the cider when bottled must not contain less than 4 per cent. of alcohol.

Having satisfied these primary conditions, the gravity must next be regulated by the desire to make sweet, medium, or dry cider.

Good sweet bottled cider can only be made from juice having originally a high specific gravity. When the original gravity of the juice is below 1.063, it is only possible to make good medium dry cider for bottling.

For dry cider, the liquid when bottled should contain 2 per cent. of sugar, and this corresponds nearly always to a gravity of 1.010.

#### FININGS.

In a letter which I received from a Member of the Society the following sentence occurs: "I do not remember ever seeing any advice or suggestions from you as to the best material to use for 'fining' purposes? Some manufacturers, I understand, employ blood, others milk, others albumin, and others isinglass. I, for one, would much like to know which is the best. Also the quantity, &c., and the method of using it."

If nothing has been said in previous Reports regarding the use of these materials, it is because the endeavour has been to point out what should be done rather than what should not be done. The use of all these finings is liable to injure the cider, either by adding to it some extraneous matter which it were better without, or by taking from it some constituent which it can ill-afford to spare. Blood, milk, and albumin are liable to introduce into the cider organisms which are best kept out. The worst sample of oily cider I have ever seen was the result of an experiment I made to clarify some cider with milk. That the milk was the cause, I cannot say; but such was the result. Milk is always likely to introduce the lactic acid organisms into cider, and should the conditions be favourable to its growth the cider would certainly be spoiled. Blood and albumin are both liable to rapid decomposition, and if the organisms of decomposition or putrefaction gain access to cider the result is a most nauseous, insipid drink.

The clarifying power of isinglass and gelatine is due to the fact that these substances combine with tannin to form a voluminous flocculent precipitate, which on settling clears the juice. But they rob it of tannin, a constituent certainly most essential to the production of good cider; and one which, in many

districts, needs to be added to rather than taken from the juice.

These are certainly theoretical reasons. But experiments have been made at Butleigh with several of these finings, and with others which have been brought to my notice, but in every case their use has been detrimental to the cider. Good cider can certainly be made even when they are used. In all the experiments check samples are kept which have not been submitted to the particular treatment under investigation. In our opinion, the cider which had not been clarified proved superior to the cider which had been clarified.

The proper way of clarifying is by filtration as described in a former Report, and this process is almost essential to good cider-making.

#### APPLE ANALYSES.

During the past season sixty-three varieties of apples have been analysed, and the results are given in an Appendix hereto. This brings the total number of apples analysed at the Experiment Station up to 326. The results obtained demonstrate most clearly how very inferior for cider-making purposes many of the varieties of apples are. How necessary, therefore, it is for cider-makers to gradually eliminate undesirable varieties from their orchards and to take care also to select desirable varieties for replanting. So far as can be judged by analysis, No. 287, the French apple, *Medaille d'Or*, is an example of a perfect cider apple. It is a small apple, but the percentage of juice is high, and this juice has a high specific gravity, thus showing richness in solid matters. But it is only when we come to examine these solid matters that the true value of the variety becomes manifest. The solids consist almost entirely of sugar; the acidity is low, the tannin high—both good points in a cider apple—and the percentage of residual matter (extractives) is exceptionally small.

Some steps certainly ought to be taken in the West of England to discover the names of the many unknown varieties now existing. How excellent some of these varieties are has previously been shown from the analytical results obtained at Butleigh. This year we have a further striking illustration among some of the apples sent from the Somerset County Farm, at Bickenhall, of which neither the names, origin, or history seems to be known. Of these, No. 10 is of quite exceptional quality; No. 6 and No. 4 are also good. No. 11, though rich in solids, contains too much acidity, and appears to be more of a dessert apple. It is evident that Nos. 2 and 9 are the kinds of apple which are not worth growing for cider-

making, when we consider that the same land and the same season enable another variety to produce 50 per cent. more solid matter.

#### THE ACTION OF FROST ON APPLES.

Mr. J. H. Symes, being anxious to determine what effect frost had on apples, sent me some ripe Pippins (No. 299), and others of the same variety which were frosted (No. 300). It will be seen that there is a close resemblance in composition between the two, except that the frosted apples were larger, and appear to have developed further than the others. Hence they gave more and richer juice. The acidity, tannin, and extractives are very similar in both juices; the only difference is the high proportion of cane sugar in the frosted apples, and this is not likely to be due to the action of frost.

We may therefore conclude that if frosted apples are not suitable for cider-making, as some believe, it is due either to changes in composition, not apparent from an ordinary analysis, but which might be discovered by special investigation; or may be, to changes affecting the yeasts, &c., which grow on the apple, and produce the desired fermentation of the juice. It is quite within the range of probability that frost may destroy desirable organisms, and leave undesirable organisms alive, so that these subsequently get the mastery during fermentation and spoil the resulting cider.

#### OILY CIDER.

Judging from the complaints which have been made to me or appeared in the Press, the year 1901 seems to have been characterised by the production of a more than usual amount of oily cider. At Butleigh there was none. As the subject is one upon which very little is known, I took the opportunity afforded to obtain samples for investigation from cider-makers in different parts of the country.

A letter appeared in the *Field* in August last from a correspondent, asking for advice as to what was the cause of, and how to remedy oily cider. Here was an opportunity for some of those who pose as authorities on cider-making, and are ready enough to criticise the work of others, to show their knowledge and to prove their willingness to act as public benefactors. Strange to say, no response has been given to that enquiry, except by one practical cider-maker, who put it down to the heat of the summer. This writer has mistaken for the actual cause what is only an augmenting influence. The same heat has been felt in many cider-cellars this season, and even greater

heat in past seasons, and yet there has been no oily cider. In years gone by, heat was supposed to be the cause of many chemical changes which are now known to be brought about by micro-organisms, while the reason why such changes are more pronounced in a warm season than in a cold is due simply to the fact that warmth promotes the growth and activity of these micro-organisms, and so increases the amount of chemical change which they bring about.

Oily cider, also called ropy, stringy, slimy, &c., is known in all cider-producing countries. The French term the complaint *graissage*, the Germans *schleim bildung*.

The cause of its origin, given by practical writers, is varied. Some say it is due to (a) the use of frost-bitten apples; (b) want of cleanliness in the casks; (c) want of tannin in the juice, &c.

Those who treat the subject more scientifically say that it may be produced (d) by a special kind of yeast; (e) by aerobic bacteria; and (f) by anaerobic bacteria, or those which cannot live in the air. It has not been my good fortune to discover any exact description of either a yeast or any bacterium which would produce oily cider, and until these have been discovered, thoroughly studied, and most accurately and minutely described, it will be quite impossible to discover whence such yeasts or bacteria come, how they get into the cider, or how they are to be guarded against. It is a remarkable fact, that while oiliness in milk and beer are known to be produced by many organisms which Lafar has described in his 'Technical Mycology,' this author writes: "With regard to the ropiness of cider, the most frequent malady to which this beverage is subject, nothing reliable can at present (1898) be reported."

The remedies which have been proposed are numerous, but have little scientific foundation.

Racking into a freshly-sulphured cask; adding glucose, cream of tartar, and pure yeast, re-fermenting, racking, &c.; adding tannin; cachou; crushed mountain-ash berries; broken gall-nuts; alcohol; Spanish earth; and aerating the cider, have all been suggested by various writers. My previous experiments with oily cider have been noticed in former Reports, and it was therein shown that the oiliness at Butleigh was due to anaerobic organisms (whether yeast or bacteria could not be discovered); that by aerating the cider the oiliness could be got rid of, and that by adding to this aerated cider a little fresh juice and re-starting fermentation a drinkable liquid could be produced. But not a good cider. The oily or slimy fermentation imparts to the liquid an unpleasant flavour which cannot be entirely got rid of.

Some of the oily cider made in '98 had been kept at Butleigh until this season; but as no improvement took place therein, it was all treated as described in my Report for 1899.

Among the samples of oily cider which have been kindly sent to me during the past year was one showing the trouble to a very marked extent. This, after repeated microscopical examinations, appeared to contain only one variety of yeast, present in very small quantities, and three varieties of bacteria: (A), the most numerous, was a very large, long bacillus; (B), less numerous, was a very thin, fairly long bacillus; and (C) was a large micrococcus.

Fortunately, this sample came into my possession two or three months before the cider-making at Butleigh, and I was able to devote a large amount of time to the study of these organisms.

The first experiment I made was to place a portion of the cider into a clean sterile bottle and shake it well up with the air; the gases given off from the cider were driven out of the vessel with a current of air, and the cider was again well shaken. Having repeated this operation several times, the cider was found to lose its oily character and became as limpid as ordinary cider. This experiment seemed to confirm my former work, which showed the change to be due to anaerobic organisms.

To check this, several plate cultures were started, each well seeded with the cider, and in varying proportions. A few yeast colonies grew on the plates, but none of the bacteria. There were one or two colonies; but when the organisms were examined under the microscope, they were quite distinct from those found in the cider, and were probably air contaminations, unavoidable in all bacteriological work, especially when carried on in the contaminated and dust-laden atmosphere of the City of London.

A series of attempts were then made to grow the organisms in an atmosphere of carbonic acid gas. This is not the place to describe in detail all the experiments made. At first it seemed as if my work would prove futile; but after waiting for five or six weeks, I found some growths were visible on cider solidified with agar, and kept hermetically sealed in a moist chamber filled with carbonic acid gas. All these growths have been most carefully studied; and when I had obtained sufficient material they were taken to Butleigh, and freshly-filtered cider was inoculated with the various cultures and with mixtures of these cultures, for it is quite possible that this complicated change in apple-juice may be brought about only by a combination of two or more of these organisms.

What will be the outcome of these experiments we shall not know until next July or August. One must not place too much

hope upon their solving the knotty problem of oily cider. For it may be that cider ordinarily contains constituents which inhibit the growth of the culpable yeast or bacterium, such, for example, as the presence of tannin in such quantity as is ordinarily found in the juice at Butleigh.

In other samples of oily cider the yeasts have been more numerous, as also the varieties of bacteria; and in one sample I could not discover, by the microscope, any organism similar to the three with which experiments have been carried out this year. The subject needs more continuous attention than, unfortunately, I have been in a position to devote to it.

But I have thought it right to describe thus fully some of the work which has been done. Even if it fails, it will serve to show how difficult are the problems relating to cider-making which science has to solve, and how necessary it is, if any lasting progress is to be made, for such experiments to extend over many years, and not be confined merely to the three months of cider-making.

It is generally said that the more sugar present in the cider the greater the tendency to oiliness. I have found this true in several cases; it may therefore be interesting to quote a case in which it did not appear to hold good. A very oily cider sent to me from Kent had the following composition:—

Alcohol, by weight .. .. .	6·15
" by volume .. .. .	7·75
Acidity fixed .. .. .	0·47
" volatile .. .. .	0·41
Total solids .. .. .	1·95

It is therefore evident that there could have been no unfermented sugar in this sample.

#### FLAVOUR AND BOUQUET.

The experiments which were started last year to determine the period at which cider acquires its flavour and bouquet all tended to show—first, that these were produced in the later stages of fermentation; and secondly, that they were in part, if not entirely, due to what may be termed the ripening processes.

In order to further investigate the subject, experiments have this season been continued along the old lines and others have been instituted. Some few varieties of apples, each having a distinct character and flavour of its own, have been separately ground, pressed, and fermented, and, as the fermentation proceeds, the changes in flavour are being carefully watched.

As I have previously stated, I am of opinion that flavour is

due to fermentation, and not to the constituents in the apple. If this supposition be correct, then what is the cause of these changes? They are undoubtedly most marked in cider which has been in bottle for a long period. If, therefore, they are brought about by organisms which have been growing in the cider, these should be found in the sediments which are formed in the bottles. A number of such sediments have been examined, and permanent preparations made thereof. I had expected to find these sediments composed mainly of yeast-cells. To my surprise I found them composed mainly of bacteria. Bacteria, therefore, appear to be the main cause of the ripening of cider; of those changes which are generally designated as secondary fermentation. But the amount of gas found in these bottles of cider, and the diminution of the sugar contents of the juice, indicate plainly that changes produced by yeast must have taken place. What, then, has become of the yeast-cells? Are they disintegrated? and by their disintegration have they contributed to this flavour production? or have they supplied food for the bacteria? All these questions arise, and need to be answered. Of even still greater importance are the questions,—What are these bacteria? Are they alike, are they different, are some capable of producing one flavour, others of producing another flavour? These are problems which have yet to be investigated.

#### WHAT KIND OF CIDER DOES THE PUBLIC WANT?

The letter which I wrote to the *Times* brought me in its trail a flood of correspondence from "all sorts and conditions of men." A study of these letters would have convinced me, if indeed I had not been already certain on the point, that the great want of cider-drinkers, especially of those who are taking it under medical advice, is a "dry" cider. Some would appear to desire an "extra dry" cider. I do not see how they are to obtain such an article, unless they are prepared to pay a much higher price for it than they seem willing to do at present. The production of an excellent extra dry cider is almost as difficult as the production of an extra dry champagne. If consumers would recognise this and be willing to pay a fair price for the skill required in its production, there are, I am sure, many cider manufacturers who could and would make it. But one might as reasonably expect to buy champagne at the price of claret as "extra dry" cider at the price of the ordinary sweet draught produce of the country.

Sweet cider, after all, if we may believe the evidence of the trade, is what the majority of cider-drinkers want. And this being comparatively easy to produce, is likely to remain the

chief product of cider-makers. None the less, it seems certain that the introduction of good dry cider would well repay any makers who would put it upon the market. By careful attention to the information contained in this and former Reports, such dry cider can be made, though necessarily with more trouble than is requisite for the production of a sweeter liquid.

There is this advantage about dry cider. It contains more alcohol and less sugar; is therefore far less liable to "go wrong," the alcohol acting as a natural preservative, and the small proportion of sugar rendering other changes improbable. The great difficulty is to prevent "acetification," and this can only be done by keeping the cider so that the air cannot gain access to it.

#### THE FUTURE.

The study of cider-making, which has now been in progress at Butleigh since 1894, has resulted in such information being obtained that it has been possible to convert the whole of the apple-juice, from the first cheese of windfalls, to the last cheese of picked, well stored, late variety apples, into good cider.

This result has been obtained with the juice of a very mixed variety of apples of no special quality. The apparatus employed has been such as nearly every cider-maker possesses, and with an expenditure of time and labour not much greater than has to be bestowed even upon the manufacture of inferior cider. There are some critics who fail to discover in the work at Butleigh any result which was not previously well known. It is a pity that such knowledge, if possessed, was not applied, or made known to those who would have been glad to utilise it. If the experiments made at Butleigh have to some cider-makers proved of no use, it only shows how determined some people are not to benefit by, or at least not to acknowledge they have benefited by, work which has been done for their advantage.

Once only during these years has any difficulty arisen, namely, the production of oily cider. What caused it? Whence it came? Why it disappeared? We know not. But this is only one of the troubles which cider-makers are liable to. Another, more common in cider factories perhaps than in farmhouses, is known as "sick" cider. Here, again, we are in ignorance both of the cause and of the origin.

To future research we must look to further aid the cider-makers against such occasional troubles. This much may be said that these troubles are undoubtedly due to the growth in the cider of micro-organisms. In this Report, I have stated the grounds on which I have formed the opinion that just as bad

cider results from the activity of injurious micro-organisms, so the best cider is the produce of beneficial microbes.

The future of research in cider-making is thus clearly pointed out; continuous study of these living denizens of the cider-cask and bottle is required until their life-history has been laid bare, until they can be either safeguarded against or destroyed, or cultivated and utilised by the cider-maker. Then the art of cider-making, instead of resting on empirical and little understood practices, will attain the position of a scientific and well controlled industry.

## APPENDIX.

## COMPOSITION OF THE JUICE OF VARIOUS APPLES, 1901.

Name of Apple.	No.	Grower.	District.	Average Weight of Apple.	Percentage of Juice.	COMPOSITION OF THE JUICE.						Extrac- tives, &c.
						Sp. Gr.	Total Solids.	Acids.	Grape Sugar.	Cane Sugar.	Tannin.	
Blenheim Orange ..	264	R. Neville Grenville	Butleigh	S. 5.00	52	1.0662	16.32	.56	9.52	4.97	.096	1.174
Broadleaf ..	265	Do.	Do.	S. 1.71	63	1.0720	17.98	.16	9.26	7.00	.446	1.114
Butleigh No. 1 ..	266	Do.	Do.	S. 1.48	81	1.0629	15.44	.16	10.44	1.28	.206	3.354
Do. No. 2 ..	267	Do.	Do.	S. 1.58	52	1.0698	17.08	.16	11.22	2.75	.118	2.882
Do. No. 4 ..	268	Do.	Do.	S. 2.56	78	1.0638	15.88	.79	8.24	4.94	.172	1.788
Do. No. 6 ..	269	Do.	Do.	S. 1.68	64	1.0558	13.80	.18	8.11	4.52	.125	.865
Do. No. 7 ..	270	Do.	Do.	S. 1.25	70	1.0530	12.95	.11	8.11	3.61	.146	.974
Do. No. 11 ..	271	Do.	Do.	S. 1.67	60	1.0619	15.97	.15	10.10	4.61	.136	.974
Do. No. 12 ..	272	Do.	Do.	S. 2.10	58	1.0700	17.20	.18	9.80	5.83	.294	1.096
Do. No. 13 ..	273	Do.	Do.	S. 1.88	57	1.0720	18.12	.20	12.20	4.47	.200	1.050
Do. No. 14 ..	274	Do.	Do.	S. 1.64	43	1.0611	20.48	.15	12.50	4.74	.168	2.922
Do. (young trees) ..	275	Do.	Do.	S. 1.53	41	1.0791	19.34	.38	10.87	4.06	.274	3.756
Do. No. 15 ..	276	Do.	Do.	S. 2.06	68	1.0718	18.15	.20	9.35	7.52	.150	.930
Do. No. 21 ..	277	Do.	Do.	S. 1.12	60	1.0629	15.66	.50	8.85	3.20	.106	3.204
Do. No. 22 ..	278	Do.	Do.	S. 3.22	64	1.0670	16.51	.23	11.43	3.28	.258	1.312

Butleigh No. 23 .. ..	279	R. Neville Grenville	Butleigh	S.	2-31	58	1-0670	16-63	19	12-28	4-11	482
Do. No. 25 .. ..	280	Do.	Do.	S.	1-58	53	1-0689	16-67	1-05	9-90	4-81	606
Chissel Jersey .. ..	281	J. H. Synes ..	Martock	S.	2-31	57	1-0640	15-62	20	9-09	2-01	826
Corvyie Red .. ..	282	R. Neville Grenville	Butleigh	S.	2-06	70	1-0558	12-15	72	8-50	1-99	848
Forwhelp .. ..	283	F. J. Hayes ..	W. Pennard	S.	2-53	59	1-0604	14-75	24	10-33	2-22	870
French Apples:—												
Bedan .. ..	284	J. Watts	Backwell	S.	2-20	48	1-0604	14-91	14	10-10	3-98	556
Cordiva Forestier ..	285	Do.	Do.	S.	2-32	54	1-0614	15-23	24	11-24	3-04	566
Frequin de Chartris	286	Do.	Do.	S.	4-17	61	1-0614	14-98	25	10-31	2-19	574
Medaille d'Or .. ..	287	Do.	Do.	S.	1-28	64	1-0644	15-94	22	10-31	5-07	580
Passe Reine des Pommes .. ..	288	Do.	Do.	S.	1-81	50	1-0674	16-43	24	10-42	4-50	582
Reinette Obry .. ..	289	Do.	Do.	S.	2-70	51	1-0534	12-83	50	11-76	3-30	492
Rouge de Treves ..	290	Do.	Do.	S.	1-91	57	1-0604	13-92	1-59	9-23	2-82	124
Unnamed .. ..	291	Do.	Do.	S.	2-95	47	1-0574	14-29	25	8-19	3-17	602
Gins .. ..	292	R. Neville Grenville	Butleigh	S.	3-00	65	1-0579	14-15	15	8-71	3-27	852
Grainers .. ..	293	Grainger ..	Do.	S.	1-17	48	1-0653	15-59	24	10-20	2-80	150
Honeycombs .. ..	294	M. J. Appleby	Glastonbury	S.	2-63	68	1-0533	14-21	12	7-75	5-18	114
Horners .. ..	295	Do.	Do.	S.	1-56	68	1-0598	14-92	14	9-30	3-11	204

S. Somerset.

APPENDIX.—COMPOSITION OF THE JUICE OF VARIOUS APPLES, 1901—continued.

Name of Apple.	No.	Grower.	District.	Average Weight of Apple.	Percentage of Juice.	COMPOSITION OF THE JUICE.						
						Sp. Gr.	Total Solids.	Acid.	Grape Sugar.	Cane Sugar.	Extrac- tives, &c.	
Jersey .. .. .	296	R. Neville Grenville	Butleigh S.	3.00 ozs.	56	1.0649	15.79	.16	10.70	2.82	.266	1.844
King's Glory .. ..	297	J. B. Richards	..	3.88	61	1.0689	15.36	.15	8.81	4.89	.270	1.240
Kingston Black .. ..	298	J. C. Waterman	Baltonsboro' S.	1.70	60	1.0681	16.77	.41	10.26	5.12	.147	.833
Lambrook Pippins ..	299	J. H. Symes..	Martock S.	1.52	59	1.0500	12.13	.70	8.17	.55	.172	2.538
Do. Do. (frosted)	300	Do. .. ..	Do. S.	2.16	68	1.0589	14.19	.76	7.93	2.89	.162	2.448
Maldens .. .. .	301	M. J. Appleby	Glastonbury S.	3.00	57	1.0653	15.90	.69	10.71	2.37	.257	1.873
Nash's Bitters .. ..	302	F. J. Hayes ..	W. Pennard S.	1.78	59	1.0796	17.87	.22	11.46	2.24	.422	3.528
Portwines .. .. .	303	J. B. Richards	..	3.31	54	1.0708	17.54	.11	12.05	2.66	.162	2.558
Red Jersey .. .. .	304	J. C. Waterman	Baltonsboro' S.	2.94	60	1.0640	16.00	.12	9.80	4.49	.238	1.352
Spick Hatch .. .. .	305	A. Compton ..	Beaminster D.	2.41	73	1.0548	13.18	.62	7.84	2.81	.066	1.844
Twist Body Jersey ..	306	J. C. Waterman	Baltonsboro' S.	1.52	60	1.0682	16.95	.12	10.75	3.96	.290	1.830
White Jersey .. ..	307	J. B. Richards	..	1.06	68	1.0669	16.44	.13	11.96	3.46	.207	1.283
Woodcock .. .. .	308	R. Neville Grenville	Butleigh S.	2.00	58	1.0588	13.75	.56	9.33	1.54	.084	2.236

## Unnamed:—

Hill Farm No. 1	309	R. Neville Grenville	Butleigh	S.	2-19	66	1-0580	14-30	·11	8-57	3-97	·182	1-508
Do. No. 2	310	Do.	Do.	S.	2-67	64	1-0551	13-70	·16	7-88	3-09	·164	·686
Goodson No. 4	311	Goodson	..		1-00	56	1-0654	14-98	·62	10-42			
Allen ..	312	Allen	..		2-81	60	1-0591	15-51	·12	9-09	4-80	·066	1-494
..	313	A. Compton	..	Beaminstor D.	1-90	61	1-0482	11-94	·18	8-94	·07	·152	2-688
..	314	Tripeck	..	Butleigh S.	2-91	49	1-0638	16-10	·12	9-62	4-27	·116	1-974
Bickenhall No. 1*	315	J. Ettle	..	Taunton S.	3-21	53	1-0568	13-93	·14	9-67	1-51	·067	2-513
Do. No. 2	316	Do.	..	Do. S.	2-63	63	1-0538	13-03	·22	9-38	1-60	·108	1-722
Do. No. 3	317	Do.	..	Do. S.	2-03	59	1-0619	15-16	·74	10-31	3-48	·280	·400
Do. No. 4*	318	Do.	..	Do. S.	2-16	49	1-0668	16-50	·17	11-56	2-18	·186	2-454
Do. No. 5	319	Do.	..	Do. S.	2-25	60	1-0578	13-72	·70	9-10	2-40	·193	1-387
Do. No. 6	320	Do.	..	Do. S.	2-71	65	1-0679	16-84	·22	9-54	6-07	·342	·688
Do. No. 7*	321	Do.	..	Do. S.	2-47	43	1-0667	16-03	·38	11-38	1-78	·095	2-365
Do. No. 8	322	Do.	..	Do. S.	3-08	57	1-0697	16-67	·58	8-03	5-98	·102	1-978
Do. No. 9	323	Do.	..	Do. S.	1-78	63	1-0547	12-74	·56	7-97	2-74	·108	1-362
Do. No. 10	324	Do.	..	Do. S.	2-16	52	1-0828	20-88	·19	13-16	2-56	·148	4-822
Do. No. 11	325	Do.	..	Do. S.	2-06	59	1-0659	16-76	·94	9-03	4-29	·184	2-316
Do. No. 12*	326	Do.	..	Do. S.	2-41	51	1-0550	13-69	·17	9-54	2-34	·090	1-550

S. Somerset.

D. Dorset.

\* No. 1, Improved Truckle. No. 4, Victoria. No. 7, Stone Apple. No. 12, Cap o' Liberty.

XV.—*The Society's 1901 Exhibition of Cider.*

By FRED. G. FARWELL, Steward.

THE number of entries for cider at the Croydon Exhibition in 1901 was 53, as against 96 at Bath in 1900, the decrease being probably accounted for by the fact that the Exhibition was not held in a cider district. This decrease was regrettable, as it is especially among Londoners and residents in the largely populated districts surrounding the Metropolis that the cider industry wants pushing.

The entries in the various classes were as follows:—

## CIDER MADE IN DEVON.

Class.	Not less than 4 per cent. of alcohol.	Entries.	Class.	Less than 4 per cent. of alcohol.	Entries.
152.—Cask of Cider .. ..	-		154.—Cask of Cider .. ..	-	
153.—12 Bottles of Cider ..	1		155.—12 Bottles of Cider ..	2	

## CIDER MADE IN HEREFORDSHIRE.

156.—Cask of Cider .. ..	1	158.—Cask of Cider .. ..	1
157.—12 Bottles of Cider ..	1	159.—12 Bottles of Cider ..	5

## CIDER MADE IN SOMERSET.

160.—Cask of Cider .. ..	9	162.—Cask of Cider .. ..	5
161.—12 Bottles of Cider ..	14	163.—12 Bottles of Cider ..	7

## CIDER MADE IN OTHER COUNTIES.

164.—Cask of Cider .. ..	1	166.—Cask of Cider .. ..	1
165.—12 Bottles of Cider ..	2	167.—12 Bottles of Cider ..	3
	<u>29</u>		<u>24</u>
Total entries containing not less than 4 per cent. of alcohol ..	29		
„ „ less than 4 per cent. of alcohol .. ..	24		
			<u>53</u>

In accordance with the conditions all exhibits had to be delivered into the Showyard not later than 6 P.M. on Saturday, May 11th, when the cases were unpacked and both bottles and casks placed in position. It was then found that 7 of the entries were absent. On Monday the 12th May a sample from each of the exhibits received was taken by the Steward and forwarded, in special bottles sent for the purpose, to Mr. F. J. Lloyd, F.C.S., for analysis. Particulars of these analyses were received from Mr. Lloyd on Monday the 20th May, and are given in Appendices A and B. Out of the 46 exhibits 11 were disqualified; 8 for having less than 4 per cent. of alcohol

though entered in classes where 4 per cent. was the minimum ; 2 for having more than 4 per cent. when that standard was the maximum ; and 1 for containing preservatives.

Mr. T. Richards, of Huxham, East Pennard, Shepton Mallet, Somerset, was the Judge appointed by the Society, and the judging took place on the first day of the Show.

In the Devon classes for cider containing not less than 4 per cent. of alcohol, there was no entry of cider in cask, and only one entry of cider in bottle, and that one was disqualified for having only 2·85 per cent. of alcohol. The classes for cider containing less than 4 per cent. of alcohol did not fare much better, as there were only two entries, both of bottled cider, and of these one was disqualified for having preservatives in it, while the other was not considered by the Judge to be of sufficient merit to deserve a prize, the cider having gone wrong, and being still in a state of ferment.

In the Herefordshire section Mr. Bazley, who made the only entry in the classes for cider in casks and bottles containing over 4 per cent. of alcohol, was in both cases disqualified owing to his exhibits being under that limit, while in the classes where 4 per cent. was the maximum, he was again disqualified, because his cider in cask contained 4·90 per cent. of alcohol. It was thus evident that Mr. Bazley must by some accident have placed the wrong class numbers on his casks, and this was especially unfortunate, as his ciders were certainly worthy of commendation. In the cider in bottles under 4 per cent. there were 5 entries, the first prize being awarded to Messrs. Yeomans Brothers for a very good cider with a delicate flavour made from Strawberry Normans, and the second prize to a good clean cider exhibited by Mr. Bazley.

The Somerset classes were better filled, there being 8 competitors in the class for cider in casks containing not less than 4 per cent. of alcohol, and 12 in that for bottled cider, while in the classes for under 4 per cent. there were 3 entries of cider in cask and 5 of cider in bottle. In the class for cider in cask containing not less than 4 per cent., Messrs. D. J. Crofts and Son secured the first prize with a very good cider made from mixed fruits ; Mr. W. T. S. Tilley took the second ; Messrs. D. J. Crofts and Son's exhibit was reserved, and that of Mr. E. Wellington was highly commended.

In the class for cider in bottle, the Rev. E. P. Spurway obtained the first prize with an excellent clear and rich cider ; Mr. W. T. S. Tilley being second ; Mr. Spurway reserve, and Mr. W. T. S. Tilley was highly commended, and for two other exhibits commended. With two exceptions, this class was a

very good one. For cider in cask containing less than 4 per cent., Messrs. D. J. Crofts and Son again took the first prize with a cider made from mixed fruits; but no second was awarded, as the Judge did not consider the others of sufficient merit. In the class for bottled cider, Messrs. J. Watts and Co. obtained the first prize with a bright clean cider; Mr. W. T. S. Tilley the second prize; Messrs. D. J. Crofts and Son's exhibit was reserved, and that of Mr. W. T. S. Tilley was commended.

In the classes open to counties other than Devon, Hereford, and Somerset the Judge declined to make any award for cider in cask or bottle containing over 4 per cent., and for cider in cask under 4 per cent.; but in the class for bottled cider under 4 per cent. he awarded a second prize to Mr. H. Thompson for a cider made from Foxwhelps and Wildings, declining to give a first prize on the ground that the cider was not of sufficient merit to compete for the Championship.

The five winners of first prizes had then to compete for the Championship, when the Judge had no difficulty in selecting the cider in bottle containing over 4 per cent. and belonging to the Rev. E. P. Spurway as the Champion and best cider in the Show, the Reserve No. going to Mr. Watts for his bottled cider under 4 per cent., both ciders being made in the county of Somerset. Mr. Spurway's cider was made entirely from Kingston Blacks, being similar to the cider he exhibited last year when he ran the Champion so close. The analysis of this apple was:—

Sp. gr.	Solids.	Acid.	Sugar.	Tannin.
1·0691	17·30	·34	15·06	·14

It is curious that the reserve cider was also made entirely from Kingston Blacks. Mr. Spurway is to be heartily congratulated on his success, as his cider was certainly far and away the best in the Show. The cider as a whole this year was disappointing, much of it appearing from the analyses to have been made from very poor apples or from very diluted juice. This can readily be seen by a perusal of the analyses in Appendix A. As each per cent. of alcohol will have been produced by the fermentation of about two parts of sugar, by doubling the alcohol and adding the total solids remaining, the original solids are obtained, and it will be at once apparent that in many instances they could only have amounted to from 11 to 14 per cent.

After the Judge had completed his task and during the remaining days of the Show, many persons interested in the cider industry availed themselves of the privilege afforded by the Society of tasting the various exhibits, and the general

consensus of opinion was that the Judge had been quite right in his awards, and especially in giving the Champion prize to Mr. Spurway's exhibit.

The cider department had also the honour of a visit from the President of the Board of Agriculture, Mr. Hanbury, who, accompanied by Sir Jacob Wilson and the Secretary of the Board (Mr. Elliott, C.B.), appeared to take great interest in the exhibits and also in the particulars supplied by Mr. Neville Grenville and Mr. Lloyd relative to the work done by the Society at its Experiment Station at Butleigh. During Mr. Hanbury's visit two of the successful exhibitors—both Somerset tenant farmers—happened to come into the Cider Pavilion, and Mr. Hanbury was able to hear from them the great value of the lessons they had learnt in the art of making cider from their visits to Butleigh, and from the reports of Mr. Lloyd. Both exhibitors assured the President that their success had been largely due to this. Unasked—for testimonials such as these show conclusively the good work which the Society is carrying on at Butleigh, and the desirability of its continuance. The importance of such experiment stations was strongly advocated by Mr. Radcliffe Cooke in an article on the Cider Industry in France and England which appeared in the August number of the *Nineteenth Century*, and he will doubtless be pleased to know that not only is such an experiment station in existence at Butleigh, but that its usefulness has received Government recognition by grants being made towards its cost from the Imperial Exchequer.

A considerable amount of correspondence has also recently taken place in the *Times* and other newspapers with reference to cider, thus showing the interest which has been aroused in the minds of the general public as to the importance of obtaining a palatable, refreshing and pure drink. The subject is so well dealt with by Mr. Lloyd in a letter addressed to the *Times*, that I have added it, together with a leading article with reference to it, which appeared in the same newspaper, to this Report. (See Appendices C. and D.)

Foreigners, too, are also interesting themselves in the investigations carried on by the Society, as will be seen from the following letter addressed to the Secretary :—

SAN SEBASTIAN,  
13th October, 1901.

SIR,—We have had a cider plant erected in the neighbourhood of this town and annexed to a cotton-spinning and weaving factory we own, which cider plant has been furnished to us by Messrs. Workman Bros., of Slimbridge, who also sent

us some of the last volumes of the Bath and West of England Society. As a consequence of this we purchased the other volumes up to 1893, and, thanks to the invaluable teachings of Mr. Lloyd, we have organised the whole of our cider-making as suggested by him, and have found in them an absolute success, although the maturing of the cider is not yet finished. As a consequence of this we should like to join your valuable Society in the name of our Don Guillermo de Brunet, who is taking a large interest in cider-making. We do not know if foreigners may be allowed to join your Society, as we do not see the names of any foreigners in the list appended to your volumes, but trust that you will manage to put our Mr. Brunet's name in the list. If so please inform us about it and we shall send in our subscription.

We remain, yours very truly,

JOSÉ BRUNET Y C<sup>IA</sup>.

APPENDIX A.—ANALYSES.

Class.	No.	Name of Exhibitor.	Specific Gravity at 60° F.	Alcohol by Volume.	Acidity.	Solids per cent.	Award.
152		No Entry.					
153	1	W. H. Batting .. ..	1·0334	2·85	·45	9·04	
154		No Entry.					
155	2	W. H. Batting .. ..	1·0304	1·85	·54	7·86	
	3	J. M. Came & Son ..	1·0314	1·70	·36	8·06	
156	4	J. Bazley .. ..	1·0343	2·05	·55	8·98	
157	5	J. Bazley .. ..	1·0343	2·45	·56	9·08	
158	6	J. Bazley .. ..	1·0263	4·90	·54	7·89	
159	7	J. Bazley .. ..	1·0313	3·55	·40	8·68	2nd Prize.
	8	J. Bosley .. ..	1·0319	2·40	·61	8·39	Reserve.
	9	Yeomans Bros. .. ..	1·0303	3·40	·40	8·34	1st Prize.
	10	Yeomans Bros. .. ..	1·0264	2·80	·36	7·05	
	11	Yeomans Bros. .. ..	1·0264	2·80	·46	7·00	
160	12	W. T. Allen .. ..				Absent.	
	13	W. F. Carter .. ..	1·0219	4·25	·39	6·44	
	14	D. J. Crofts & Son ..	1·0243	4·70	·44	7·28	Reserve.
	15	D. J. Crofts & Son ..	1·0183	5·40	·80	5·99	1st Prize.
	16	H. J. Davis .. ..	1·0113	5·80	·38	4·35	
	17	C. Osborn & Son .. ..	1·0199	3·75	·37	5·80	
	18	W. T. S. Tilley .. ..	1·0279	4·10	·45	8·03	2nd Prize.
	19	H. Tucker .. ..	1·0254	3·60	·53	6·58	
	20	E. Wellington .. ..	1·0214	4·45	·32	6·37	H. C.
161	21	W. T. Allen .. ..				Absent.	
	22	D. J. Crofts & Son ..	1·0250	4·45	·57	7·44	
	23	D. J. Crofts & Son ..	1·0214	4·50	·34	6·42	C.
	24	H. J. Davis .. ..	1·0119	4·90	·33	4·18	
	25	H. J. Davis .. ..				Absent.	
	26	C. Osborn & Son .. ..	1·0184	4·10	·41	5·56	
	27	Rev. E. P. Spurway ..	1·0394	4·50	·56	10·86	{1st Prize and Champion.
	28	Rev. E. P. Spurway ..	1·0315	4·00	·51	8·92	B.
	29	W. T. S. Tilley .. ..	1·0314	3·70	·50	8·77	
	30	W. T. S. Tilley .. ..	1·0275	4·45	·46	8·04	2nd Prize.
	31	W. T. S. Tilley .. ..	1·0216	4·85	·46	6·41	H. C.
	32	W. T. S. Tilley .. ..	1·0181	5·15	·40	5·93	C.
	33	H. Tucker .. ..	1·0266	3·50	·47	6·80	
	34	J. Watts & Co. .. ..	1·0361	3·15	·56	9·76	
162	35	W. T. Allen .. ..				Absent.	
	36	D. J. Crofts & Son ..	1·0280	3·70	·59	7·93	1st Prize.
	37	H. J. Davis .. ..	1·0181	3·20	·38	5·17	
	38	C. Osborn & Son .. ..	1·0201	3·95	·41	5·95	
	39	W. T. S. Tilley .. ..				Absent.	
163	40	W. T. Allen .. ..				Absent.	
	41	D. J. Crofts & Son ..	1·0300	2·80	·58	8·08	Reserve.
	42	H. J. Davis .. ..	1·0286	1·65	·52	7·20	
	43	H. J. Davis .. ..				Absent.	
	44	W. T. S. Tilley .. ..	1·0258	3·55	·39	7·19	2nd Prize.
	45	W. T. S. Tilley .. ..	1·0149	3·40	·31	4·42	C.
	46	J. Watts & Co. .. ..	1·0409	1·65	·65	10·52	{1st Prize & B. for Champion.
164	47	R. Rout & Son .. ..	1·0058	5·25	·44	2·80	
165	48	R. Rout & Son .. ..	1·0028	6·15	·43	2·35	
	49	R. Rout & Son .. ..	1·0088	5·25	·43	3·56	
166	50	Swanley Cider Co. ..	1·0168	3·40	·58	4·89	
167	51	Swanley Cider Co. ..	1·0228	4·10	·55	6·57	
	52	Swanley Cider Co. ..	1·0388	2·30	·46	10·20	
	53	H. Thomson .. ..	1·0289	2·00	·64	7·57	2nd Prize.

## APPENDIX B.

Class.	No.	Name of Fruit.	Information relative to Fruit.	Soil of Orchard.	General Information.
152.		No Entry.			
<b>Cider made in Devon.</b>					
<i>Casks containing not less than 4 per cent. of alcohol.</i>					
153.	1	Unselected	Fruit ripe in November. Trees usually good bearers. Crop much below average.	Red sandstone.	Orchards manured by cattle.
<i>Bottles.</i>					
<i>Ditto.</i>					
154.		No Entry.			
<i>Casks containing less than 4 per cent. of alcohol.</i>					
155.	2	Mixed	Same as No. 1.		
<i>Bottles.</i>	3	Sweet, Bitter Sweet, and Mild Sour, mixed.	Fruit ripe October to November. Trees usually very good bearers. Crop below average. Weight of apples, 5 to a lb. Sp. gr. of juice, 1.050.	Light loam.	Orchards manured with farmyard manure in 1899.
<i>Ditto.</i>					

156. Cider made in Hereford- shire.	4	Equal quantities of Fox- whelp and White Nor- man.	Fruit ripe in September and October. Trees not good bearers. Crop below average.	Clay.	Orchards manured with sheep.
Casks con- taining not less than 4 per cent. of alcohol.					
157. Bottles. Ditto.	5	Same as No. 4.			
158. Casks con- taining less than 4 per cent. of alcohol.	6	Equal quantities of White Norman and Kingston Black.	Same as No. 4.		
159. Bottles. Ditto.	7 8	Same as No. 6. Fifty per cent. Old Fox- whelp; ten per cent. White Norman; forty per cent. mixed.	Fruit gathered in October and allowed to ripen till December. Crop below last season. Trees, except Foxwhelp, are usually good bearers; 5, 6, and 7 apples to a lb. Sp. gr. of juice, 1.053.	Rich loam.	Sheep fed in orchard. Pure Foxwhelp cultures used. Fermentation taken every five hours and checked when running away too fast. Outcrop of yeast good. Cider cleansed well.
	9	Strawberry Norman	Fruit ripe in November. Trees usually good bearers. Crop below average.	Clay.	
	10	Kingston Black	Fruit ripe in November. Trees usually good bearers. Average crop.	Ditto.	
	11	Equal quantities of Canon apples and Cummees.	Fruit ripe in November. Trees excellent bearers. Average crop.	Ditto.	

## APPENDIX B.—continued.

Class.	No.	Name of Fruit.	Information relative to Fruit.	Soil of Orchard.	General Information.
180. Cider made in Somerset. Casks con- taining not less than 4 per cent. of alcohol.	12	Absent.			
	13	Three-fifths Hangdowns and two-fifths Kingston Blacks.	Trees bloom very late and generally escape frost. The juice was a very good colour and sweet.	Clay on white lias stone.	Pigs and poultry run in orchard.
	14	Mixed.. ..	Fruit ripe in November. Trees usually good bearers. Crop below average. Sp. gr. of juice, 1·058.	Loam, with clay subsoil.	Orchards not manured lately.
	15	Mixed.. ..	Fruit ripe in November. Trees usually good bearers. Crop below average. Sp. gr. of juice, 1·054.	Ditto.	Ditto.
	16	Equal quantities of Red, White, and Green Jer- seys, with few Kingston Blacks, and Cap of Liberty.	Fruit ripe in October and November. Trees usually good bearers. Crop below average. Apples generally not ripened so much as in 1899. Sp. gr. of juice, 1·052.	Sandy loam, clay subsoil.	Cattle fed on oil-cake grazing in orchards.
	17	Equal quantities of King- ston Blacks, Cadbury's, and Sandford Jerseys, with smaller proportion of Cap of Liberty.	Fruit ripe in October and November. Trees usually good bearers. Crop below average and smaller. Weight of apples about 2½ oz. Trees much blighted; apples smaller and sp. gr. lower than usual. Sp. gr. of juice, 1·0560.	Deep sandy loam.	Orchards fed and farmyard manure used.
	18	Equal quantities of King- ston Blacks, Royal Jer- seys, Gius, and Horners.	Fruit ripe in November. Trees, except below average. Owing to dry time when fruit was forming, apples did not gain so much sugar as is required. Sp. gr. of juice, 1·068.	Clay sub- soil.	Pigs and sheep continually fed in orchards.
	19	Equal quantities of mixed Jerseys and Kingston Blacks.	Fruit ripe in December. Trees usually good bearers. Sp. gr. of juice, 1·028.	Loam, subsoil clay.	Orchard not manured.

161.	20	One-third each Kingston Blacks, Broadleaf, and another.	Fruit ripe in November. Trees good bearers in alternate years. Crop below average. Weight of apples, 2 to 3 oz.	Heavy loam, clay subsoil.	Orchards fed with cattle and pigs.
Bottles.	21	Absent.			
Ditto.	22	Same as No. 14.			
	23	Same as No. 15.			
	24	Same as No. 16.			
	25	Equal quantities of Cadbury's and Red and Chisel Blacks and Cap of Liberty.	Fruit ripe in October and November. Trees usually good bearers. Crop below average; apples small. Apples generally blighted and not ripened so much as in 1899. Sp. gr. of juice, 1.050.	Sandy loam, clay subsoil.	Cattle fed with oil-cake grazing in orchards.
	26	Same as No. 17.			
	27	Kingston Blacks .. ..	Fruit fully ripe in December. Trees usually good bearers. Crop a little over average. Weight of apple, 2.7 oz. Apples kept in hurdle store for nearly six weeks. Sp. gr. of juice, 1.075. Trees usually good bearers. Crop a little over average. Weight of apples, 2.7 oz. Fine fruit but wet when gathered. Sp. gr. of juice, 1.063.	Strong loam, over heavy clay.	Sheep grazing in orchards.
	28	Two-thirds Kingston Blacks; one-third Bitter Sweet.	Fruit fully ripe in December. Trees usually good bearers. Crop a little over average. Weight of apples, 2.7 oz. Fine fruit but wet when gathered. Sp. gr. of juice, 1.063.	Ditto.	Ditto.
	29	Equal quantities of French Jerseys, Nais's Bitters, and Cadburys.	Fruit ripe early in November. Trees usually fair bearers. Crop below average. Sp. gr. of juice, 1.066.	Clay subsoil.	Pigs and sheep constantly fed in orchards.
	30	Same as No. 18.			
	31	Equal quantities of Doves, Pomeroy's, Ladies Hearts, and others.	Fruit ripe early in November. Trees usually fair bearers. Crop below average. Sp. gr. of juice, 1.068.	Ditto.	Pigs and sheep continually in orchard. Cider tended to become dry quicker than ever known this season in almost all cases.

APPENDIX B.—*continued.*

Class.	No.	Name of Fruit.	Information relative to Fruit.	Soil of Orchard.	General Information.
162. Cider made in Somerset.	32	Equal quantities of Chisel Jersey, Red Jersey, and Horners.	Fruit ripe early in November. Red Jerseys not good bearers. Crop below average. Sp. gr. of juice, 1.066.	Clay subsoil.	Pigs and sheep continually in orchards. Cider this season below the average generally.
	33	Equal quantities of Jerseys & Kingston Blacks, small quantity of Cap of Liberty.	Fruit ripe in December. Trees usually good bearers. Sp. gr. of juice, 1.025.	Loam, subsoil clay.	
	34	Kingston Blacks .. ..	Apples reduced to pulp by modern grater	Heavy loam.	
	35 36	Absent. Mixed .. ..	Fruit ripe in November. Trees usually good bearers. Crop below average this year. Sp. gr. of juice, 1.052.	Loam and clay subsoil.	
163. Casks containing not less than 4 per cent. of alcohol.	37	Equal quantities of Red and Sandford Jerseys, with few Horners, Kingstons, and Cap of Liberty.	Fruit ripe in October and November. Trees usually good bearers. Crop below average. Apples small, generally blighted and not ripened as in 1899. Sp. gr. of juice, 1.050.	Sandy loam, clay subsoil.	Cattle fed on oil-cakes grazing in orchards.
	38	Equal quantities of Cadbury, Mill Jerseys, and others.	Fruit ripe in October and November. Trees good bearers in alternate seasons. (Crop below average. Weight of apples about 3 oz. Trees much blighted and sp. gr. lower than usual. Sp. gr. of juice, 1.0450.)	Deep sandy loam.	Orchards fed and farmyard manure used.
163. Bottles. Ditto.	39	Equal quantities of New Cadbury, Horners, and Pip Jerseys.	Fruit ripens in November. Pip Jerseys are not good bearers. Crop below average. Sp. gr. of juice, 1.068.	Clay subsoil.	Pigs and sheep continually in orchards.
	40	Absent.			
	41	Same as No. 36 .. ..	{ Sp. gr. of juice, 1.054.		
	42	Same as No. 25 .. ..			
	43	Absent.			
	44	Same as No. 39 .. ..			
	45	Equal quantities of New Cadbury and Old Cadbury.	Fruit ripe late in October. New Cadbury are usually good bearers.	Ditto.	Pigs and sheep continually in orchard.

164.	Cider made in Counties other than Devon, Hereford, or Somerset.	47	Equal quantities of Bramley's Russets and Pippins.	Fruit ripe in October. Trees very good bearers. Crop above average. Average weight of apples, 1·7, 1·6, 1·9. Sp. gr. of juice, 1·0382.	Stiff clay.	Orchards not manured.
165.	Casks containing not less than 4 per cent. of alcohol.	48	Mixed fruit, including London Pippins, Crows Eggs, &c.	Fruit ripe in October. Trees very good bearers. Crop above average. Average weight of apples, 1·8, 2·4. Sp. gr. of juice, 1·0563.	Clay.	Sheep folded in orchards.
166.	Bottles. Ditto.	49	One-half Blenheim Orange and equal quantities of Ribstones and Fill Baskets.	Fruit ripe in October. Trees fairly good bearers. Crop above average. Weight of apples, 1·7, 2, 1·5. Sp. gr. of juice, 1·0553.	Ditto.	Orchards not manured.
167.	Casks containing less than 4 per cent. of alcohol.	50	Equal quantities Margils and Sweet Laydens.	Fruit ripe early in October. Trees usually good bearers. Crop very heavy. Weight of apples about 46 lbs. per bushel.	Heavy loam.	Orchards fed by sheep.
167.	Bottles. Ditto.	51	Handsels and part mixed	Crop generally above average.	Various.	
		52	Two-thirds Sweet Layden, one-third Edgings.	Fruit ripe early in October. Trees usually good bearers. Crop above average. Weight of apples about 46 lbs. per bushel.	Heavy loam.	
		53	Equal quantities Foxwhelp and Wildings.	Fruit ripe in November. Trees usually fair bearers.	Heavy.	

## APPENDIX C.

## CIDER.

TO THE EDITOR OF THE "TIMES."

SIR,—There is unfortunately no doubt that a certain quantity of cider is made in England with little regard to cleanliness, but that cider so made is supplied to the public may with confidence be denied. The manufacture of cider on many farms is carried out solely to supply drink to the labourers, and partly from carelessness, but mainly from ignorance, the resulting liquid, from want of a little care, is really nauseating. Those, however, who are engaged in making cider for the public know that such carelessness would be ruinous, hence scrupulous cleanliness, and in many cases considerable scientific knowledge, are brought to bear to ensure the production of good cider.

Thanks to the prominence which the *Times* has given to cider as a beverage, the demand for this liquid has greatly increased of late years, and far more attention is being paid to its manufacture, even among farmers, than formerly. What we need is education; on the part of manufacturers to know how to prepare the best cider, and on the part of consumers to know health-giving cider from liquids the hygienic qualities of which are, to say the least, doubtful.

The German name for cider is apple-wine. Hence cider-manufacturers in Germany were naturally led to look upon the liquid as a wine, and upon its preparation as an art requiring much the same care and knowledge as were requisite for the production of grape-wine. In France, although the name is distinct, the knowledge and methods of wine-production are so general that they have also materially affected the cider industry. In England, unfortunately, we have had no great national industry demanding a knowledge of fermentation, or necessitating schools of viniculture; the manufacture of cider has been an unscientific art, practised in many cases with considerable ability where conditions were favourable, but neglected where conditions were unfavourable and difficulties were met which could neither be explained nor overcome for want of knowledge.

The Bath and West of England Agricultural Society, recognising this want, has of late years, with the financial assistance of the Board of Agriculture, been carrying out investigations into the manufacture of cider, and it has been my privilege to be entrusted with the work. Having devoted some considera-

tion to the practical question, what kind of cider ought makers to produce? and as this question materially affects the relative merits of wine and cider as beverages, may I venture to encroach on your space with some suggestions?

When we speak of wine we have in our minds Rhine wine, Burgundy, claret, champagne, or some other distinct variety; but when we speak of cider, although various makes may differ quite as much as do these wines, we have no names whatever to designate them by, no means of distinguishing between a sweet or dry, a light or heavy liquor. Yet the difference exists. I have on analysis found cider to contain 1 oz. of sugar in every 10 oz. of liquid, and another cider to contain less than 1 oz. of sugar in 100 oz. of liquid. Both of these were genuine; but to some men the first would be a poison, while the latter would be more beneficial than any fermented grape juice. Hence we want distinct brands of cider. Next, it will be necessary for each brand to be of uniform quality. This is the greatest difficulty the cider maker has to overcome; one, however, which if not mastered will prevent cider ever competing with wine.

The public taste has of late years gradually but markedly favoured "dry" wines, and one of the chief obstacles to the increased consumption of cider has been the obstinate persistence of makers in putting on the market excessively sweet cider, a liquid which clogs the palate and does not slake thirst. Many men find it impossible to drink such a liquid either alone or with their meals. Place before them a good dry cider, and few will ask for wine. I know this from personal experience.

There is another advantage in dry cider. The natural preservative of every fermented liquor is alcohol, and provided sufficient alcohol is produced naturally in the cider no other preservative is necessary. It is the absence of alcohol, and the presence of unfermented sugar, which necessitates the use of salicylic acid or other preservatives; and these substances ought to be prohibited in all drink.

It may be asked—If the public require a dry cider, why do not the manufacturers produce it? Unfortunately in many cases they cannot. Judging from the results of many analyses the apples in some parts of England have been so neglected that their juice contains an abnormal quantity of acid. In the production of cider, unless great care be taken, there is a tendency for acid to be produced owing to defective fermentation, and it is to hide the excess of acidity that the sugar is left in the liquid. The production of good cider, like the production of good wine, depends not alone on care and skill in manufacture, but also demands a good natural product to start with. We

needs must improve our orchards quite as much as our methods of manufacture if we desire to produce excellent cider. But when such cider is obtainable, and fortunately much is produced already, there are few wines which for wholesomeness and palatability can compete with it.

Landlords and tenants in cider-making counties should combine to develop the capabilities of this industry, and strive to retain for English agriculturists at least one source of income which the foreigner has not yet taken from them.

I am, sir, yours obediently,

FREDERICK J. LLOYD.

Muscovy House, Trinity Square, E.C.,

Sept. 18, 1901.

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#### APPENDIX D.

The following appeared as a leading article in the *Times* of September 18th, 1901 :—

"We publish this morning an instructive letter from Mr. F. J. Lloyd, F.C.S., who tells us that he has been employed by the Bath and West of England Agricultural Society, with the assistance of the Board of Agriculture, in carrying out a series of investigations into the manufacture of cider; and who furnishes us with a general statement of the results of his work, as well as with an account of the modifications of existing methods which he considers to be necessary in order that cider may be placed in a position to compete seriously with wine or with other mildly alcoholic beverages. The subject, as our correspondence has frequently borne witness, is one of considerable interest to a great number of persons; and Mr. Lloyd's conclusions, if they should hereafter be made public in a fuller and more official form, will be certain to command a large amount of attention, and will probably influence favourably the important industry to which they relate. There will be a general consent, on the part of all who are familiar with cider and with cider-growing districts, that Mr. Lloyd is fully justified in saying that the manufacture is even now carelessly conducted in a certain proportion of cases, especially in those in which, as he tells us, the liquid is not made with a view to sale, but merely as a drink for the labourers on the farm which yields the apples. We have somewhat lost sight of the present condition of the facts in this regard; but fifty or sixty years ago every farmer in Devonshire had sufficient ground laid out in orchards to furnish cider for his own labourers, and the annual

cider-making was as much a part of the farm business as the corn or the hay harvest. To men actively engaged in work sweet cider was abhorrent, and hence the bulk of the home-made drink was distinctly sharp in flavour, while the ordinary consumers did not in the least object to a considerable amount of turbidity. A small quantity of sweet cider was made on many farms, from apples specially selected for the purpose, but was intended for use only as an occasional luxury. The farmer's wife would give it in tall glasses to favoured guests, or to children as an occasional treat, and it had no market or saleable value. The practical meaning of the word cider was a rough, sharp, pleasantly sub-acid drink, which quenched thirst admirably, was only in a small degree intoxicating, and never palled upon the palate which had once been educated to its flavour.

"An habitual cider drinker in the country, if in those days he paid a chance visit to London, or to some other locality in which the beverage was only known as an imported article, would be likely to find 'cider' announced for sale at public-houses or in refreshment bars; and, if he called for his favourite liquor, would scarcely be likely to repeat the experiment. In the first place, what was offered to him would usually be artificially sweetened by the vendor, in order to correspond with his customary belief that cider was a sweet drink; and, in the next place, it would be flavoured with sulphurous acid, with which it had been impregnated at the farm, in order to enable it to travel and to neutralise the effects of hasty or imperfect fermentation. As Mr. Lloyd tells us, there was no generally diffused knowledge of the proper methods of conducting fermentation; but the farmer was perfectly well aware that his product could not be trusted to travel unless it were 'matched,' and that, if he neglected this precaution, it would probably be returned upon his hands. A piece of brimstone was burnt inside the cask, and the cider, thus flavoured, was sent upon its way. For a good many years, however, this original or old world state of things has been in process of change. Railroads, by bringing about increased personal communication between urban and rural districts, have necessarily tended to render local manufactures known and valued in places remote from those in which they are produced; and cider, greatly by reason of its unquestionable merits, and greatly because its claims have been strenuously advocated by Mr. Radcliffe Cooke and others, has had its full share of the increased demand which has been thus occasioned. The not unnatural result has been that its production, at all events as a beverage to be sent away for sale, has fallen into fewer hands and has been more carefully

conducted, with obvious advantage to the quality of the manufacture; and we think that Mr. Lloyd scarcely does justice to the extent to which this change has been carried, or to the excellence of the cider now supplied by makers who observe all the precautions which he indicates. Only last week we published a letter from Mr. R. G. Graham, stating that there was a firm 'even in Devonshire' who make their cider upon scientific principles, selecting their apples for each of their brands, and guaranteeing their product to consist solely of the pure juice of these apples. As such, Mr. Graham told us, the cider supplied by them will keep for any length of time without the employment of antiseptics. The letter from Mr. Alban Bellairs, which we published yesterday, proclaiming the excellence of the methods adopted in the preparation of the beverage at Whimble, supports Mr. Graham's defence of the Devonshire liquor. What is true of Devonshire is equally true of other cider districts; and there are firms in Herefordshire and in Norfolk by whom the manufacture is conducted with every precaution that skill, science, and experience can suggest.

"Mr. Lloyd is certainly right in his observation that care of the orchards is of at least as much importance as care in dealing with the harvests which they yield; and it is on this point perhaps, more than on any other, that the average grower requires instruction. The protection of the trees from injurious insects and the sacrifice of any undergrowth which can interfere with the supply of nutritive materials from the soil are matters of the first importance, concerning which much ignorance commonly prevails, and on which much may be done by the employment of those visiting instructors whose useful labours have recently been described in our columns. The maintenance of 'brands' and the continued applicability of distinctive names can be secured only by manufacture on a large scale, such as may render it possible always to make any given brand from the same description of fruit, and thus to retain its characteristic flavour and qualities. From this point of view, therefore, we are much inclined to think, if cider is ever to assume the position of a popular beverage in places distant from those in which it is produced, that the share of the farmer in its production must be limited to the duties of the apple-grower, and that the judicious admixture of apples, the selection of perfectly sound fruit for the highest classes of product, and the general conduct both of the fermentation and, when this is done, of the bottling, will be better left in the hands of large manufacturers. The great cider-makers will, no doubt, always grow apples of their own, just as great manufacturers of wine will usually have their own vineyards; but the former class, like the latter, will

also require to purchase their raw material from other growers, and to use their own knowledge and judgment with regard to blending and selection. As long as cider is made on every farm it can never be other than an uncertain, and often badly-finished, product. As soon as the function of the farmer is limited to the supply of good apples, the manufacture of the beverage may be so conducted as to yield the best possible results, and to justify the encomiums upon good cider which our columns have frequently contained, and which have rested, in the great majority of instances, upon the testimony of excellent and experienced judges."

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XVI.—*Reports upon the Society's Experiments for the Improvement of Permanent Pastures.* By W. ASHCROFT, Steward, and F. J. ROWBOTHAM, Botanical Visitor.

EXPERIMENTAL SITE NO. 1, AT TALATON, OTTERY ST. MARY, DEVON.

OWNED by Sir John Kennaway, Bart., and occupied by Mr. George Daw, of Larkbere Farm, Ottery St. Mary.

The following particulars of the site were furnished by the occupier at the commencement of the Experiment in 1895:—

Nearest railway station	.. ..	Whimble (L. & S. W. R.).
Distance from ditto	.. ..	One mile and a half.
Name of Field	.. ..	Sicklands.
Area	.. ..	Eleven acres.
Character of top soil	.. ..	Clay.
Thickness of ditto	.. ..	Six to seven inches.
Nature of surrounding country	.. ..	Hilly.
Slope of Field	.. ..	Towards the north.
Situation	.. ..	Not near cattle yard.
Nature of grass	.. ..	Much alike in quality throughout
Length of time known to have been laid down to grass	.. ..	Eight years.
When sown	.. ..	
Description of grass seeds sown	.. ..	In the spring with a cereal crop.
		Red and White Clover, Alsike, Italian, Devon Evers. No others have been sown since.
When mown or grazed	.. ..	Twice mown in 1894.
Tendency of herbage	.. ..	To scorch in a dry summer.
Manures last applied	.. ..	In 1894.
Description of ditto	.. ..	Mixed.
Feeding stuffs used during last five years for the cattle grazing the field	.. ..	Corn.
Reputation of Field	.. ..	
		That dairy cows do fairly well on it.



*No. 1.—Plot in North Pit Park Field.***REPORT OF THE BOTANICAL VISITOR.**

When I first saw this field, in June, 1899, it presented a growth of such poor quality as to be practically worthless for feeding purposes. The main constituents of the herbage at that time were Carnation-grass and Rush, and numerous other weeds, with which were associated a few pasture grasses. At the present time the herbage generally of the field is rather better, probably as the result of a dry warm spring (the land being naturally cold and wet), which has served to bring on whatever bottom herbage was present. Such improvement, however, is rather more apparent than real, since the improved conditions have only multiplied the constituents of the normal herbage; and I only mention this because it serves to illustrate the manner in which many of these poor, cold lands vary in accordance with different seasons. On the plot, however, the improvement effected by the Basic Slag is in marked contrast to that apparent in the rest of the field, for here there is a strong development of Clovers and other Leguminosæ, and just as marked a diminution of useless weeds. Yarrow, it is worth noting, has been remarkably stimulated on the plot this year. The general lack of moisture, however, which was needed when the growth had started, has prevented any of the herbage attaining the requisite depth to make it luxurious; but the stock have shown their appreciation of the dressings by cropping the herbage of the plot close to the ground.

*No. 2.—Plot in Broad Park.*

The improvement which I noted in my visit last year is maintained at the present time. This experiment possesses a special interest from the fact that the ground is normally and almost exclusively held by worthless weeds, and the displacement of these by the Leguminous herbage, as the result of a single dressing of Basic Slag, speaks abundantly in favour of the beneficial effects of this manure on poor pastures of this character.

*No. 3.—Plot in Fullyford.*

The whole of this field, with the exception of a small portion left for the purpose of comparison, has now been dressed with

**Basic Slag.** Although the dryness of the season has hindered the growth of the herbage, the effects of the manure are easily perceived by the comparative abundance of the Clovers in the newly-slagged portion. On the original plot the effects are still more marked, the Leguminous herbage forming quite a compact bottom. I observe that the improvement in palatableness includes the grasses as well as the Clovers, stock having cropped the entire herbage close to the ground.

#### NOTES BY THE STEWARD (MR. W. ASHCROFT).

The summer of 1901, like many previous summers, proved to be too dry for manures to have any effect on the poor soils at this site; the start in the spring and early summer could not be maintained. In October, however, all the improvement noted by Mr. Rowbotham was quite apparent.

The plot in Broad Park showed, both in character of herbage and from the way it had been grazed by stock, a decided improvement on the rest of this small field.

In the winter of 1900 to 1901 Fullyford was all dressed with slag, with the exception of the original one acre plot. This was first dressed with slag in December, 1897, and subsequently with a half dressing in December, 1899, and looked better, as one would naturally expect, than the remainder of the field only dressed last winter; but the appearance of the unmanured strip was quite sufficient testimony to the improvement effected by the more recent application.

In North Pit Park the improvement in the general character of the herbage (not alone the increase in the Clover) on the plot, and in the way the plot had been grazed, was decidedly more distinctive than at any time since the slag was first applied.

It must be borne in mind that the above three fields are, as pointed out in vol. x., page 108, a long way from the farmyard and the dung-heap, and being naturally poor, wet, and cold, are remarkably deficient in herbage worth calling such; and that the main object of the experiment has been to see whether the improvement always set up by a first dressing of Basic Slag on the soils in this district could be maintained by further dressings, until the character of the bottom grasses had been so altered, that with fair grazing it would never again fall to its original state.

It is not intended that the expense should be great. To demonstrate how to improve such wretched fields at an expense of 4*l.* or 5*l.* an acre is futile, because few tenants have the

money, and, even if they had, the expenditure on such land, with dry summers taken into consideration, would be absurd.

Mr. Daw has (since the Society commenced experiments here) applied Basic Slag over nearly all the grass fields on the farm, and has worked considerable improvement in their grazing capabilities and value. Some, of course, are of very much better character than the fields alluded to above, but all have benefited by the application of the slag.

# EXPERIMENTAL SITE NO. 2, AT KILLERTON, DEVON.

Owned by Sir Thomas Acland, Bart., and occupied by Mr. Lewis Tout, of Broadclyst, Devon.

The following particulars of the site were furnished by the occupier at the commencement of the Experiment in 1895:—

Nearest railway station .. ..	Broadclyst (L. & S. W.).
Distance from ditto .. ..	About two miles.
Name of Field .. ..	Landhay.
Area .. ..	9 a., 3 r., 30 p.
Number on Ordnance Survey Map	1925.
Thickness of top soil .. ..	Two feet.
Colour of ditto .. ..	Dark brown.
Character of ditto .. ..	Light loam.
Thickness of sub-soil .. ..	Under 2 feet; shovel went down freely.
Colour of ditto .. ..	Light or yellowish.
Character of ditto .. ..	Sand and a little gravel.
Average annual rainfall for the district .. ..	Thirty-three inches.
Nature of surrounding district ..	Flat.
Slope of Field .. ..	Slightly southward.
Height above sea-level .. ..	Seventy-five feet.
Situation of cattle-yard .. ..	Higher and south.
Drainage .. ..	None. Does not require it.
Nature of grass .. ..	Much alike in quality throughout.
Length of time known to have been down to grass .. ..	Twenty years.
When sown .. ..	{ Thought to have been in spring with barley.
Grass seeds sown .. ..	Usual permanent seeds for a light loam.
Cost of ditto .. ..	About 32s. 6d. per acre.
When mown or grazed .. ..	Usually grazed.
Tendency of herbage .. ..	To scorch.
When manured .. ..	Probably not for twenty years.
Feeding stuffs used .. ..	A few oats during lambing season.
Head of Stock field is reckoned to carry .. ..	Four bullocks and ten sheep.
Reputation of Field .. ..	{ Not one on which dairy cows will do well.
Chief fault of Field .. ..	Want of "condition."

An area of 5 acres has been treated thus:—

1 20	Renovated by re-seeding.				1 20
	Lime. 4 tons per acre.	Basic Slag. 8 cwt. per acre.	Basic Slag 6 cwt. and Kainit 3 cwt. per acre.	Dung. 15 loads per acre.	
20					20

5 Plots—1 acre each.

#### REPORT OF THE BOTANICAL VISITOR.

Date of visit, July 19th, 1901.

From my examination of this site the following results are apparent:—

The Lime Plot contains a good deal of White Clover, and more Hard Fescue than any of the other plots, and the herbage has been tightly cropped by stock. Yarrow is very abundant on the plot at the present time.

On the Basic Slag Plot there is a very fair bottom of White Clover, and on this and the preceding plot the turf is fine and compact.

The herbage of the Basic Slag and Kainit Plot consists very largely of *Agrostis*, or Bent-grass, while the Dung and Bone-meal Plots contain a large proportion of weeds, and make no show at all this year.

From these results it is, I think, apparent that the two manures which have operated most beneficially in modifying the herbage of this pasture are Lime and Basic Slag.

I do not anticipate that any further result will accrue from the application of the manures.

#### EXPERIMENTAL SITE NO. 3, AT WANSTROW, SOMERSET.

Owned by W. Hurle Clarke, Esq., and occupied by Mr. Richard H. Yeoman.



The salt and superphosphate were repeated on half of their respective plots in the beginning of 1898.

The lime was repeated in December, 1898, on half of the plot, taking a quarter from each end for the purpose. The slag was repeated in December, 1898, on half the plot in the same way.

#### REPORT OF THE BOTANICAL VISITOR.

Date of visit, June 13th, 1901.

The improvement of the herbage on the Basic Slag Plot is still marked, especially on the re-slagger portion at the upper end of the plot, which last year hardly showed any difference from the ordinary herbage of the field. The proportion of Clovers is, however, owing to the drought conditions which have prevailed since the spring, not so apparent at the present time as it was a year ago. At the lower end of the plot I observe an abundant growth of Brome-grass (*Bromus mollis*), which seems to have profited by the season.

On the Lime Plot the herbage seems to have undergone considerable improvement since last year, especially on the portion which was re-limed in December, 1898, the Fescue grasses being very prominent on this latter portion.

There is nothing to report with regard to the other plots, except that (but in a lesser degree than on the Basic Slag and Lime Plots) the proportion of weeds is decidedly smaller than on the rest of the field. Taking with this the fact that the Clovers have been considerably increased, and several of the grasses as well, I think the improvement may be said to have assumed a permanent character.

#### NOTES BY THE STEWARD.

On this site when visited, on June 25th, there was a good crop just ready for cutting, comparing well with the general character of the meadow-hay crops, which are exceptionally light; there was very little difference to be observed in any of the plots.

#### BASIC SLAG PLOT, IN MR. BENNET'S FIELD, AT WANSTROW, SOMERSET.

This plot was dressed with 8 cwt. of Basic Slag per acre in December, 1898.

#### REPORT OF THE BOTANICAL VISITOR.

Date of visit, June 13th, 1901.

This plot, owing no doubt to the dryness of the spring, does

not exhibit nearly so heavy a growth of Clovers as it did at this time last year. There is, nevertheless, plenty of clover in the bottom, and the improvement, especially as regards the elimination of the coarse weeds, such as Knap-weed, Cat's-ear, Hawkbit, Rib-grass, normally so abundant in the pasture, is quite maintained at the present time. The only grass which appears to have been encouraged, so far, is Yorkshire Fog, which is remarkably prominent this year on the plot.

The rest of the field was sown with Basic Slag last spring, and when compared with the small portion left unslagged, exhibits already considerable improvement.

I would suggest that the interest in this experiment might be increased by the application of a dressing of farm-yard manure to the Basic Slag Plot in the autumn. Or (as I understand that the plot itself was not re-dressed with slag at the time when the rest of the field received its dressing) I would suggest that the plot should receive another dressing of slag in the autumn, followed, in the early spring, by a dressing of farm-yard manure.

#### NOTES BY THE STEWARD.

Visited June 25th. The presence of Yorkshire Fog in the hay crop (as noted by Mr. Rowbotham) was the most marked feature on this plot. The crop, though this is the third season since the slag was applied, is still very much better than the remainder of the field which the tenant had slagged last winter.

#### EXPERIMENTAL SITE NO. 4, AT STOCKBRIDGE, NEAR SHERBORNE, DORSET.

Owned by J. K. D. Wingfield-Digby, Esq., M.P., and occupied by Mr. Bird.

The plot in this field was first dressed with Basic Slag in the spring of 1895. In the winter of 1898-99 it received a second application of slag, when the entire field was dressed with the same manure. In August of 1900 a top dressing of farm-yard manure was supplied to the plot.

#### REPORT OF THE BOTANICAL VISITOR.

Date of visit, June 14th, 1901.

The most noticeable fact in regard to the herbage of this field at the present time is the marked increase in the proportion of grasses. The stimulation of the grasses is so great, in fact, that the contrast between the field and the plot (which in this respect was so marked last year) is not nearly so evident now,

Another point is the almost complete disappearance of Quake-grass, formerly so abundant in the field. Rye-grass and Dog's-tail are still the most prevalent grasses present. With regard to the weeds, the proportion of Cudweed has not, seemingly, been materially reduced, but very little Rush or Sedge is to be seen at the present time. Regarding Cudweed, it should be borne in mind that this plant was formerly exceedingly abundant in the pasture, and probably, owing to the conditions of moisture which still prevail, it will continue to hold its own for some time. The proportion of Clovers and other Leguminous plants in the field is still very large, Red Clover being especially abundant. On the whole, therefore, and considering the dryness of the season, the improvement in the herbage of this field may be said to be fully maintained.

The plot in this field was re-slagged last spring, and so far as one can judge at present, the re-dressing has scarcely benefited the herbage; but this may be due to the lack of moisture, as the plot lies rather high. As was the case last year, however, the plot carries a heavy growth of grasses. Rye-grass is still very abundant, but the quantity of Brome-grass—a useless grass of coarse growth—is very large at the present time; small patches on the plot have scorched, these probably mark the position of gravel pockets in the soil, and are occupied almost exclusively by Brome-grass. On the other hand, whilst the quantity of Brome-grass is apparently increased, another objectionable grass, Yorkshire Fog, which normally was exceedingly plentiful in the pasture, has not increased in proportion, while Quake-grass has, owing to the improved conditions of growth and competition, seemingly gone under completely.

I do not think that anyone who was familiar with the state of the herbage of this field three years ago could fail to be struck by the improved aspect which it presents at this time. To be assured of the extent of the benefit which has accrued to the field as a whole, it is only necessary to compare the treated portion with the small piece of field left unmanured.

#### **OTHER BASIC SLAG EXPERIMENTS AT STOCKBRIDGE FARM.**

##### **REPORT OF THE BOTANICAL VISITOR.**

Date of visit, June 14th, 1901.

##### *No. 1.*

Basic Slag was applied to a large portion of the field in the winter of 1898-99, a very small part being left undressed for purposes of comparison.

This is normally an exceedingly poor pasture, occupied for the most part by coarse weeds. When I visited the site in June last year, the Basic Slag, which had been applied in the winter of 1898-99, had produced a marked change by the stimulation of the Leguminous herbage. At the present time, however, the herbage seems to have "gone back," owing partly, no doubt, to the dry spring, and partly to the fact that the heavy growth of Clovers last year failed to get properly grazed, and by covering the ground prejudiced the growth of the after-math. There is, however, reason to believe that after a good rain, which is much needed here, the condition of this pasture will be greatly improved.

*No. 2.*

Basic Slag was sown by hand in the winter of 1898-99 on nearly the whole of the pasture, only a small portion being left undressed for comparison.

The herbage of this field, which has always been of somewhat better quality than that of the pasture just described, makes a very fair show, though the top-growth is not nearly so heavy as it was last year. The strip left unslagged last year has since been dressed with slag, and the herbage exhibits already a marked improvement upon the normal condition. Quake-grass, which was here formerly abundant, has disappeared, but for this fact the dryness of the season may be partly accountable.

There can, I think, be no question that the treatment to which this and the preceding field have been subjected has well repaid the outlay. When it is considered that the normal herbage of both fields was extremely thin, and that Field Rush, Knap-weed, and other coarse-growing weeds had obtained what seemed to be a permanent footing in the soil, the filling in of the interspaces by Clovers, the encouragement of several grasses of good feeding quality, and the discouragement of the weeds, afford striking proofs of the genuineness of the improvement worked by the application of the Basic Slag.

**EXPERIMENTAL SITE NO. 5, AT WEST GRINSTEAD, SUSSEX.**

Owned by Rev. J. Goring, and occupied by Mr. John Reeve, of Champions, West Grinstead, Horsham, Sussex.

The following particulars of the site were furnished by the occupier at the commencement of the Experiment in 1895:—

Nearest railway station	.. ..	West Grinstead (L. B. & S. C. R.).
Distance from ditto	.. ..	One mile.
Name of Field	.. ..	Poor Field.

Area .. .. .	Ten acres.
Number on Ordnance Survey Map .. .. .	562.
Thickness of top-soil .. .. .	About four inches.
Colour of ditto .. .. .	Rather light.
Character of ditto .. .. .	Heavy and stiff.
Colour of sub-soil .. .. .	Lighter than top-soil.
Character of ditto .. .. .	Very heavy.
Nature of surrounding district .. .. .	Hilly.
Nature of Field .. .. .	{ Fairly level, but slopes slightly north-wards.
Situation of cattle-yard .. .. .	Quarter of a mile off.
Drainage .. .. .	Good.
Nature of grass .. .. .	Much alike in quality.
Length of time known to have been down to grass .. .. .	{ Nine years.
When sown .. .. .	Spring, with cereal crop.
Description of grass seeds sown .. .. .	{ Ordinary mixture ordinarily used in the district.
(A few lbs. per acre of different sorts of clover seeds have been sown since.)	
When last mown .. .. .	In 1894.
Average hay crop .. .. .	About one ton per acre.
Tendency of herbage .. .. .	Scorches rather.
When manure last applied .. .. .	In 1893.
Description of ditto .. .. .	Basic slag.
Feeding stuffs used during last five years for the cattle grazing the Field .. .. .	{ Cake and corn.
Head of stock Field is reckoned to carry .. .. .	{ Six or seven in a growing season.
Description of Field .. .. .	Inferior, the soil being naturally poor.

An area of 4 acres has been treated thus :—

	Salt.—4 cwt. per acre.				
Lime. 2 tons per acre.	Basic Slag. 8 cwt. per acre.	Basic Slag. 4 cwt. per acre.	Superphosphate. 4 cwt. per acre.	Superphosphate.—3 cwt. per acre. Kainit.—2 cwt. per acre.	Nothing.
	Peat Moss	Manure.	—10 loads per acre.		

The experiment was begun by manures being applied December, 1895.

A year later the sub-Plot, dressed with Basic Slag, which had only previously received 4 cwt. per acre, received an additional 4 cwt. per acre, and the salt was repeated on the salt strip.

In December, 1898, the Slag Plot, with the exception of the salt strip, received another dressing of 4 cwt. per acre, and the superphosphate and super. and kainit was repeated on their respective plots. In the spring of 1899 half the salt strip was dressed with nitrate of soda ( $1\frac{1}{2}$  cwt. per acre).

#### REPORT OF THE BOTANICAL VISITOR.

Date of visit, July 16th, 1901.

Owing to the dryness of the season there is practically nothing to be noted in regard to the herbage of this site at the present time. Mr. Reeve has been singularly unfortunate. The heavy rainfall in the storm of July 6th in most parts of the country never reached his farm, although it actually burst within a few miles of it! Consequently, the ground is parched and fissured, and the herbage for the most part burnt up. The most that can be said at the present time is that the Clovers appear to maintain their lead in the Basic Slag Plot, but the whole appearance of the plot does not contrast favourably with some other parts of the field where, though no manure has been applied, the soil is naturally somewhat moister.

Doubtless, if the late rains prove to be fairly heavy, the field will recover itself sufficiently to make a later inspection worth undertaking.

#### NOTES BY THE STEWARD.

This site has once more proved to be one of the most unfortunate in the distribution of rainfall in the south-east of England.

In no district was the rainfall in a generally dry spring and summer more unpropitious. The contrast in this respect between this corner of Sussex and the district of Alresford, where the sheep and mutton experiments are being conducted, was remarkable, although they are no very great distance apart. I visited the site twice, in the beginning of June and at the end of August; on both occasions the want of rain was most apparent.

The old site, began in 1895, calls for no particular comment, there was very little material difference anywhere, with the

exception that the Lime Plot, on my second visit in August, showed to advantage over the others. This is worth noting, because for at least three years after the application of the lime, the plot was decidedly worse than where the ground had not been so treated.

#### BASIC SLAG PLOTS AT WEST GRINSTEAD, SUSSEX.

Basic Slag Plots, Nos. 1 and 2, were dressed with 8 cwt. of slag per acre in December, 1898.

In this field, so marked was the improvement in the half acre which was so treated in 1898, that the whole of the field was dressed during this last winter, with the exception of strips of two lands, each about half an acre in all, left for comparison.

#### REPORT OF THE BOTANICAL VISITOR.

Date of visit, July 16th, 1901.

##### *No. 1.—The "Patches" Field.*

The appearance of this field at the present time abundantly testifies that it has been well named. There are several extensive patches occupied almost exclusively by Dyer's Greenweed (*Genista tinctoria*), and Knapweed or Hardheads; while other portions of the field are given up to compact assemblages of Ox-eye Daisy, Cat's-ear, Knapweed, Wood Betony, &c., &c. In a few spots one remarks the presence of Leguminosæ and grasses. The Dyer's Greenweed, however, by its coarse growth, and the fact that it is ripening its seed and spreading itself far and wide, forms a serious obstacle to the spread of the useful constituents of the herbage. I have in former Reports called attention to the weediness of this pasture, and it is an interesting fact, and one which, despite the adverse conditions of moisture which prevail, is still very marked, that the Basic Slag appears to have been successful not only in stimulating to a very great extent the Leguminous herbage of the plot, but also in repressing those baleful weeds which normally form so large a part of the herbage. There is an abundance of Clovers and grass at the present time on the plot, but the lack of moisture has prevented the growth becoming in any sense heavy.

Owing to the presence in such large quantities of many coarse weeds, I think that it would be a useful extension of this experiment to have a second plot sown with Basic

Slag, with the object of further testing the capabilities of the manure to cope with such strong-growing and injurious weeds as the Dyer's Greenweed.

*No. 2.—“Danesfold Six-acres” Field.*

The whole of this field, with the exception of a small portion left for comparison, has received a dressing of Basic Slag since my previous visit. Owing to the dry weather, the results of this application are not so apparent as they might have been. At the same time, however, there is good evidence that the manure is doing for the newly slagged portion what it did for the original plot, viz., bringing on the White Clover and Bird's-foot Trefoil, and discouraging the spread of Carnation-grass, Rush, and other weeds, which it will be remembered were normally the chief constituents of the herbage of this poor pasture. The original plot itself shows signs of further improvement in the encouragement of the Leguminosæ, and the present condition of the field is such as to afford suitable feeding herbage for stock.

NOTES BY THE STEWARD.

As noted in vol. xi., page 135, the owner (the Rev. J. Goring) allowed half the cost of Basic Slag to dress a very poor 16 acre field (Newlands). A strip of half an acre is left right through the field, and the two sides have been dressed with 8 cwt. and 4 cwt. per acre respectively.

In June the drought was beginning to tell, and again, at the end of August, it was still holding. There was therefore very little to note, as on both visits the clover herbage which the slag had begun to stimulate was more or less parched up.

In order to test the result of a nitrogenous manure on the gramineous herbage in addition to the slag, about three-quarters of an acre on each side have, on the advice of Dr. Voelcker, this winter been dressed with Homco Rape meal.

No. 1. The “Patches” field.

No. 2. “Danesfold Six-acres.”

Mr. Rowbotham's Report says all that there is to say.

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*XVII.—Report of an Experiment for Ascertaining the Influence of Various Manures upon the Production of Mutton.*

By W. ASHCROFT, Steward.

IN the last issue of the Society's 'Journal' (vol. xi., page 141) some particulars were given of the site selected for this experiment, of the general arrangements for conducting the experiment, and of the treatment of the plots.

The manurial treatment set out at the end of that Report was completed early in the spring of 1901.

The plots were stocked on the 16th May, 1901, with nine sheep to a plot, and these were weighed every four weeks, till the 2nd October—a period of twenty weeks.

Records of the weights gained by the sheep have been furnished to the Board of Agriculture, but the Board, when the experiment was initiated, reserved to itself the right of deferring the publication of any records or comparative statements with respect to the variously manured plots, until further experiment had either confirmed or disproved the results previously arrived at.

The sheep bought this year for the experiment were fifty Hampshire Down wethers and sixty half-breds (Southdown and Kent). The Hampshire Downs were bigger sheep, and in better condition than those with which the plots were stocked in 1900. Four Downs and five half-breds, as nearly equal in live weight as possible, were placed on each plot. The half-breds in 1901 proved themselves to be the better sheep of the two for grazing, for during the twenty weeks they were grazed they increased considerably more in live weight than did the Downs.

We had the good fortune not to lose a single sheep during the whole season, and to have no case of lameness.

There was always sufficient rain to keep the grass going; that part of the country being more fortunate in this respect than a good many others. It shared, of course, with other parts of the country the long spell of cold unseasonable weather in the latter part of the spring—which naturally resulted in a hay crop far below that of 1900, and accounts for the very small produce on the sub-plots—but after that there was quite enough rain. The trying month in 1900 at Sevington was the second month (June to July); the trying month this year was the third month (July to August).

Considering that the sheep on only one plot had cake, they did very fairly well, as we were able to have sixty of them killed and sold to the butcher by weight.

Upon the two plots which had an application of Basic Slag and the one dressed with lime there was an improvement in the character of the herbage; and the improved grazing capabilities of these plots will no doubt be more marked next season.

With the assistance of the Board of Agriculture similar experiments are being conducted at about twelve other sites, and it is to be hoped that after next summer there will be some interesting information to give to the public.

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XVIII.—*The Milk and Butter Test Classes at the Croydon Exhibition.* By Dr. J. A. VOELCKER, M.A., F.I.C., and ERNEST MATHEWS.

MILK TEST CLASSES.

THE Society's Consulting Chemist (Dr. Voelcker) reported upon these classes as follows:—

“The conditions in these classes were slightly modified from those which were imposed at the Bath Meeting of 1900, the percentage of total solids now required being (on the average of two milkings) 12 per cent. instead of 12·25 per cent. The other conditions remained as before.

“Out of twenty-seven original entries in the two classes, nineteen actually competed, and were divided into two lots, according as their live weights came above or below 900 lbs. This resulted in eleven cows being placed in the ‘heavy’ division and eight in the ‘light’ division. Of the former, six were Shorthorns, two Lincoln Red Shorthorns, two Jerseys, and one Guernsey, while all the eight cows in the ‘light’ class were Jerseys.

“The cows were all thoroughly milked out at 5 P.M. on Thursday, May 23rd, in presence of the Stewards, and the competitive milkings were taken on Friday, May 24th, at 7 A.M. and 5 P.M., the milk being weighed and sampled on each occasion, and subsequently analysed.

“As the result of the chemical analysis, four cows—Nos. 682, 690, 696, and 698—were disqualified in the ‘heavy’ class, the milk not coming up to the specified requirements, but all the cows (Jerseys) in the ‘light’ class qualified.

“In Class 99 (under 900 lbs. live weight), No. 701, Dr. Watney's ‘Sharab,’ which had been third in this class at Bath in the previous year, gained now the first place, giving 2 lbs. more milk than its nearest rival, the Hon. Mrs. Murray Smith's

## MILK TEST CLASSES.

Class.	No.	Owner and Cow.	Breed.	Live Weight.	Age.	Number of Days in Milk.
				lbs.	Years.	
99 (Cows under 900 lbs. live weight.)	456	{ Mr. C. W. Armitage's "Mig- nonne" .. .. . }	Jersey	877	7½	56
	458	Mr. J. Brutton's "Dulce" ..	"	739	5	51
	475	{ Hon. Mrs. Murray Smith's "La Chasse Camelia" .. .. . }	"	761	6	..
	688	{ Viscount Enfield's "Gloam- ing 4th" .. .. . }	"	849	7½	..
	693	{ Hon. Mrs. Murray Smith's "Lorna" .. .. . }	"	831	8½	112
	694	{ Mr. W. B. Roderick's "Genteel 2nd" .. .. . }	"	845	7½	52
	700	{ Dr. H. Watney's "Syndic's" Thorn 2nd" .. .. . }	"	803	4½	114
	701	Dr. H. Watney's "Sharab" ..	"	795	4½	104
100 (Cows 900 lbs. live weight and over.)	607	{ Mr. J. D. Parson, jun.'s "Lady Langton" .. .. . }	Guernsey	936	5½	..
	681	Lord Braybrooke's "Dewberry"	Jersey	..	5½	48
	682	Mr. J. Evens' "Burton Plenty"	{ Lincoln Red }	1253	7½	..
	683	Mr. J. Evens'	"	1416	5	..
	685	{ Mr. J. T. French's "Crystal Queen" .. .. . }	Shorthorn	1567	7	51
	686	{ Mr. J. T. French's "Naughty Nancy" .. .. . }	"	1444	7½	82
	689	Viscount Enfield's "Musk" ..	Jersey	979	5½	..
	690	Mr. J. Innes's	Shorthorn	1431	..	..
	691	Mr. J. Innes's	"	1404	..	..
	696	{ Lord Rothschild's "Moppy" Gem 2nd" .. .. . }	"	..	10½	..
	698	{ Lord Rothschild's "Princess" Rose" .. .. . }	"	..	6½	..

**MILK TEST CLASSES.**

Quantity of Milk.			Quality of Milk.				No. of Points for Milk.	No. of Points for Lactation.	Total No. of Points.	Awards.
Morning.	Evening.	Total.	Morning.		Evening.					
			Fat.	Solids.	Fat.	Solids.				
lbs. oss.	lbs. oss.	lbs. oss.	Per cent.		Per cent.					
24 2	15 14	40 0	4.53	13.54	5.4	14.22	40.0	1.60	41.6	
18 8	15 4	33 12	4.85	13.80	6.75	15.46	33.75	1.10	34.85	
21 2	15 7	37 9	3.5	12.49	5.5	14.57	37.56	..	37.56	
21 2	16 6	37 8	5.8	15.32	6.0	15.10	37.5	..	37.5	
26 10	18 4	44 14	3.9	13.02	5.3	14.25	44.87	7.2	52.07	2nd Prize.
16 12	12 10	29 6	6.6	15.80	8.6	17.45	29.37	1.2	30.57	
20 13	14 1	34 14	5.8	15.02	7.5	16.60	34.87	7.4	42.29	3rd Prize.
27 2	19 12	46 14	4.45	13.57	6.0	14.92	46.9	6.4	53.27	1st Prize.
23 2	19 12	42 14	3.33	12.32	4.4	12.92	42.87	..	42.87	
28 12	23 8	52 4	4.4	13.95	5.55	14.42	52.25	.80	53.05	3rd Prize.
34 2	29 2	63 4	2.25	10.87	3.45	11.80	63.25	..	63.25	{ Deficient in quality.
36 6	24 2	60 8	2.25	11.08	5.45	14.15	60.5	..	60.5	1st Prize.
23 10	18 0	41 10	2.70	12.36	4.50	13.93	41.6	1.10	42.7	
25 8	19 10	45 2	3.6	12.31	6.8	15.12	45.12	4.20	49.32	
17 0	13 14	30 14	5.4	14.97	6.1	15.12	30.87	..	30.87	
28 2	23 9	51 11	2.60	12.20	3.9	13.20	51.7	..	51.7	{ Deficient in quality.
34 8	25 14	60 6	3.05	12.18	3.7	12.72	60.37	..	60.37	2nd Prize.
34 12	26 1	60 13	2.40	11.12	3.2	11.77	60.81	..	60.81	{ Deficient in quality.
31 8	26 4	58 12	2.60	11.48	3.3	11.97	58.75	..	58.75	{ Deficient in quality.

'Lorna.' The milk also was of richer quality. The result—in points—was not quite as good as last year. It is worthy of notice that the prize-winner would have taken third place in the other division, judged by yield of milk alone, and this even when competing with cows of the Shorthorn breed. The third prize winner was No. 700 (Dr. Watney's 'Syndie's Thorn 2nd'), which, by aid of the allowance for period of lactation, just beat No. 456 (Mr. Armitage's 'Mignonne'). The two cows placed first and second were well in advance of the rest.

"In Class 100 (over 900 lbs. live weight) three heavy milkers, Nos. 682 (Lincoln Red), 696 (Shorthorn), and 698 (Shorthorn), giving respectively, at the two milkings together, 63 lbs. 4 ozs., 60 lbs. 13 ozs., and 58 lbs. 12 ozs. of milk, were disqualified owing to poorness of quality of milk, and No. 690 (51 lbs. 11 ozs.) was eliminated for a similar reason. It is only fair, however, to say that No. 682 was not well at the time; this cow was the first prize winner at the Bath Meeting of 1900, when she gave 57 lbs. 11 ozs. of milk at the two milkings. Mr. Evens, however, was compensated by his other cow, No. 683 (also a Lincoln Red), taking the first prize with a milk yield of 60 lbs. 8 ozs. Nevertheless, it was only by a 'shade' that this cow qualified, the morning's milk having shown not more than 2.25 per cent. of fat and 11.08 per cent. of total solids. It was only the high quality of the evening's milk that enabled the cow to take the place she did. Following very closely upon the first prize winner was No. 691 (Mr. Innes's Shorthorn), which gave 60 lbs. 6 ozs. of milk, or only 2 ozs. less than its rival, the milk here, though not high in quality in the morning, being better than that of No. 683. The third place was taken by the Jersey cow, No. 681 (Lord Braybrooke's 'Dewberry'), with the excellent yield of 52 lbs. 4 ozs. of milk, and this of high quality.

"While the results of these competitions are quite satisfactory as regards the 'light' class and Jersey cows generally, it is to be feared that owners of Shorthorn and cross-bred cows are tempted by the desire of putting forward animals of heavy milk-producing capacity, to overdo them in respect of their feeding at the time of the competitions, and frequently risk incurring disqualification on account of deficiency in quality."

#### BUTTER TEST CLASSES.

The English Jersey Cattle Society offered prizes for cows of any breed or cross, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by that Society.

There were two classes, one for animals under 900 lbs. live weight, and the other for animals of 900 lbs. live weight and over.

The prizes in each class were, first, 10*l.*; second, 3*l.*; third, 2*l.* Gold, silver, and bronze medals were offered in addition for the three Jersey cows, entered or eligible for entry in the English Jersey Herd Book, obtaining the greatest number of points in the test, as well as a special prize of 1*l.* for the best quality of butter produced by any Jersey cow awarded a medal, prize, or certificate of merit in the tests.

The Judge (Mr. Ernest Mathews) reported as follows :—

“Thirty-seven cows arrived at the Showyard to compete for the milking trial and butter-test prizes, offered respectively by the Bath and West and Southern Counties’ Society and the English Jersey Cattle Society. Of these, thirty-five competed for the butter-test prizes.

“The cattle in both classes were treated alike, the same milk being utilised for both sets of trials. Samples of morning’s and evening’s milk were taken by Dr. Voelcker, and an allowance for the amount withdrawn was made in calculating the butter weights and ratios.

“The cows were stripped at five o’clock on Thursday evening, May 23rd, the milk of the next twenty-four hours being taken for the test. The milks were separated on Friday evening through the Farmers’ Alfa Steam Turbine Separator.

“Churning commenced at 7.30 on Saturday morning, and the awards were published by four o’clock. The accompanying Table gives full details of the test, and also the practice adopted in churning. The test was a remarkably good one, the averages of the cattle being as follows :—

CLASS 101.—UNDER 900 LBS. LIVE WEIGHT.

—			Days in Milk.	Milk Yield.		Butter Yield.		Butter Ratio.	Points.
				lbs.	oz.	lbs.	oz.	lbs.	
22 Cows (all Jerseys)	..	..	106	33	3½	1	13½	17·95	34·84

CLASS 102.—900 LBS. LIVE WEIGHT AND OVER.

6 Jerseys	..	..	..	..	166	31	15½	2	0¾	17·08	41·60
6 Shorthorns	..	..	..	..	48	53	12	1	13½	29·40	30·48
1 Guernsey	..	..	..	..	84	42	14	1	11½	24·72	32·15

“The gold, silver, and bronze medals, given by the English Jersey Cattle Society, were won by Dr. H. Watney.

## BUTTER TEST—OPEN

CLASS 101.—COWS OF ANY BREED OR CROSS,

No. in Catalogue.	Exhibitor.	Name of Cow.	Breed.	Live Weight.	Date of Birth.	Date of last Calf.	Number of days in Milk.		Milk Yield.	Butter Yield.
701	Dr. H. Watney ..	Sharab (X. 332) ..	Jersey	lbs. 793	Dec. 16, '96	Feb. 9, '01	104	46	14 2	10 4
700	Dr. H. Watney ..	Syndic's Thorn 2nd (XII.) ..	"	802	Jan. 1, '97	Jan. 30, '01	114	34	14 2	7 4
459	J. R. Corbett ..	Em (VI. 178) ..	"	873	Mar. 4, '92	Apr. 4, '01	50	42	14 2	11 4
456	C. W. Armitage ..	Mignonne (VII. 218) ..	"	877	Feb. 18, '94	Mar. 29, '01	56	40	8 2	14
458	J. Bruton ..	Dulce (X. 235) ..	"	729	Apr. 3, '96	Apr. 3, '01	51	33	12 1	15 4
463	J. Spencer Evans	Oakland's Rosette (XII.) ..	"	781	Mar. 2, '97	Aug. 27, '00	270	21	0 1	3
464	A. Gibbs ..	Buttercup 3rd (VII. 184) ..	"	850	Apr. 23, '92	Apr. 8, '01	46	40	2 2	11
466	Col. H. McCalmont	Freedom (XI. 248) ..	"	875	Jan. 30, '97	Apr. 4, '01	50	29	10 1	15 4
467	Col. H. McCalmont	Lady Brighton (XII.) ..	"	787	Oct. 27, '97	Feb. 23, '01	90	40	8 1	10 4
476	D. Mutton ..	Lemon (IX. 246) ..	"	808	Aug. 26, '95	Jan. 3, '01	141	27	5 1	10
486	J. Spencer Evans	Mousy 10th ..	"	691	Jan. 24, '98	Mar. 14, '01	71	30	1 1	9 4
688	Viscount Enfield	Gloaming 4th (VIII. 208) ..	"	849	Nov. 5, '93	Mar. 20, '01	55	37	8 2	6 4
693	(Hon. Mrs. Murray) Smith	Lorna (VI. 340) ..	"	831	Feb. 26, '93	Feb. 1, '01	112	44	14 2	2 4
694	W. B. Roderick ..	Gentee 2nd ..	"	845	June 2, '93	Apr. 2, '01	52	29	6 2	5
703	J. Spencer Evans	lno of Oaklands (XII.) ..	"	698	Feb. 27, '98	Sep. 19, '00	248	21	9 1	4 4
706	W. B. Roderick ..	Granville Lily 2nd (VI. 244) ..	"	799	May 29, '87	Jan. 12, '01	132	37	2 1	10 4
708	Dr. H. Watney ..	Lady Sherbet 2nd (XI. 272) ..	"	708	Dec. 25, '97	Mar. 2, '01	83	32	6 2	21
465	A. Gibbs ..	Lass of Jersey 2nd (VIII. 228) ..	"	864	Apr. 18, '93	Apr. 4, '01	50	38	4 1	11 4
475	(Hon. Mrs. Murray) Smith	La Chasse (Camelia) (IX. 240) ..	"	761	Apr. 25, '95	Apr. 28, '01	26	36	9 1	9
704	C. and M. Palmer	Sweep (X. 344) ..	"	673	Jan 24, '96	Sep. 25, '00	241	14	13 0	11 4
705	C. and M. Palmer	Start (X. 298) ..	"	769	Apr. 2, '96	Dec. 1, '00	174	18	14 1	1 1
707	W. B. Roderick ..	Bella's Beauty (VI. 38) ..	"	842	June 14, '92	Jan. 20, '01	124	32	10 1	6 4

## CLASS 102.—COWS OF ANY BREED OR CROSS,

709	Dr. H. Watney ..	Red Maple (X. 320) ..	"	968	July 14, '96	Oct. 31, '00	206	38	13 2	4 4
681	Lord Braybrooke	Dewberry (IX. 209) ..	"	909	Nov. 5, '95	Apr. 6, '01	48	62	4 2	12 4
710	Dr. H. Watney ..	Lavanja (VI. 446) ..	"	930	Mar. 5, '91	Dec. 1, '00	174	34	0 2	1
477	D. Mutton ..	Lucy 5th (VI. 362) ..	"	1074	Aug. 4, '93	Sep. 3, '00	263	37	12 1	10 4
689	Viscount Enfield	Musk (IX. 266) ..	"	979	June 4, '95	Jan. 8, '01	136	30	14 1	15 4
711	Dr. H. Watney ..	Shrub (X. 332) ..	"	942	Oct. 7, '96	Dec. 3, '00	172	26	2 1	8 4
607	(J. D. Toogood) Parsons	Lady Langton ..	Guernsey	936	Jan. 15, '96	Mar. 1, '01	84	42	14 1	11 4
682	J. Evans ..	Barton Plenty ..	Shorthorn	1253	1893	Apr. 15, '01	39	63	4 1	8 4
683	J. Evans ..	Quantity ..	"	1416	1896	Apr. 18, '01	36	60	8 2	6 4
685	J. T. French ..	Crystal Maid ..	"	1567	1894	Apr. 3, '01	51	41	10 1	7 4
686	J. T. French ..	Naughty Nancy ..	"	1444	1893	Mar. 3, '01	82	45	2 2	7 4
690	J. Innes ..	.. ..	"	1431	..	Mar. 29, '01	56	51	11 1	11 4
691	J. Innes ..	.. ..	"	1404	..	Apr. 26, '01	28	60	6 1	12 4

\* The "Butter ratio" represents the number of lbs. of milk required to make 1 lb. of butter.

† The points by which the prizes are awarded are calculated as follows:—One point for every ounce. Certificates of merit are granted to cows under five years old obtaining 28 points, and Cows five

# The Milk and Butter Test at the Croydon Exhibition. 189

TO ALL BREEDS.

UNDER 900 LBS. LIVE WEIGHT.

Butter Ratio.*	Colour and Quality of Butter.	No. of Points for Butter.	No. of Points for Lactation.	Total No. of Points.	Awards.†	CHURNING TABLE.					
						Time.			Temperature.		
						Began.	Finished.	Duration.	Dairy.	Cream and Churn.	Butter Milk.
	Colour.	Quality.				a.m.	a.m.	min.	deg.	deg.	deg.
17-64	Excellent		42-50	6-40	48-90	1st, 10 <sup>th</sup> .	and gold medal	9 27	9 40	13	62 52 53
14-03	Excellent		39-75	7-40	47-15	2nd, 31.	and bronze medal	9 24	9 37	13	62 52 57
15-68	Excellent		43-75	1-00	44-75	3rd, 21. and 11.	Prize for best butter	7 50	8 0	10	57 52 53
18-96	Pale	Fair	33-75	1-60	35-35	Certificate of merit	..	7 43	8 4	21	57 52 54
17-00	Good		31-75	1-10	32-85	Certificate of merit	..	7 46	8 3	17	57 52 53
17-65	Pale	Good	19-00	12-00	31-00	Certificate of merit	..	8 9	8 28	19	59 52 55
19-02	Good		33-75	1-60	34-35	Certificate of merit	..	8 15	8 25	10	59 52 54
14-92	Excellent		31-75	1-00	32-75	Certificate of merit	..	8 37	9 11	34	60 52 57
24-68	Fair		26-25	5-00	31-25	Certificate of merit	..	8 26	8 44	18	60 52 53
16-80	Pale	Soft	26-00	10-10	36-10	Certificate of merit	..	8 43	8 58	15	60 52 55
19-04	Pale	Fair	25-25	3-10	28-35	Certificate of merit	..	9 11	9 40	29	62 52 58
15-48	Excellent		38-75	1-50	40-25	Certificate of merit	..	9 12	9 42	30	62 52 54
20-66	Good		31-75	7-20	41-95	Certificate of merit	..	9 20	9 37	17	62 52 56
12-70	Good		37-00	1-20	38-20	Certificate of merit	..	9 18	9 30	12	62 52 56
16-62	Pale	Fair	20-75	12-00	32-75	Certificate of merit	..	9 27	9 45	18	62 52 58
22-62	Good	Fair	26-25	9-20	35-45	Certificate of merit	..	9 58	10 31	33	63 52 57
14-90	Excellent		34-75	4-30	39-05	Certificate of merit	..	9 55	10 27	32	63 52 57
22-45	Good		27-25	1-00	28-25	..	..	8 18	8 23	11	59 52 54
23-40	Pale	Good	25-00	..	25-00	..	..	8 40	8 55	15	60 52 55
29-97	Good		11-25	12-00	23-25	..	..	9 37	9 50	13	63 52 55
17-76	Excellent		17-00	12-00	29-00	..	..	9 35	10 0	25	63 52 58
23-46	Excellent	Soft	22-25	8-40	30-65	..	..	9 52	10 12	20	63 52 57
900 LBS. LIVE WEIGHT AND OVER.											
17-13	Good		36-25	12-00	48-25	1st, 10 <sup>th</sup> .	and silver medal	10 39	11 5	26	66 52 57
18-89	Excellent	Fair	44-25	8-05	52-30	2nd, 31.	..	10 4	10 17	13	64 52 56
16-48	Excellent		33 00	12-00	45-00	3rd, 21.	..	9 52	10 29	37	63 52 57
16-59	Fair	Soft	26-75	12-00	38-75	Certificate of merit	..	9 4	9 25	21	62 52 55
16-80	Fair		31-25	9-60	40-85	Certificate of merit	..	10 25	10 56	31	65 52 57
16-88	Good		24-75	12-00	36-75	Certificate of merit	..	10 46	11 14	28	66 52 58
24-72	Excellent	Fair	27-75	4-40	32-15	..	..	7 35	8 5	30	56 52 54
41-30	Pale	Soft	24-50	..	24-50	..	..	10 3	10 24	21	64 52 57
29-55	Pale	Fair	32-75	..	32-75	..	..	10 11	10 41	30	65 52 57
28-34	Bad		23-50	1-10	24-60	..	..	10 14	10 45	31	65 52 57
18-39	Bad		39-25	4-20	43-45	..	..	10 37	10 45	18	66 52 58
30-34	Good		27-25	1-60	28-85	..	..	10 31	10 48	17	66 52 56
33-60	Good	Soft	28-75	..	28-75	..	..	10 44	11 24	42	66 52 57

Ten lbs. of milk are reckoned as equal to an Imperial gallon.  
of butter, one point for each completed ten days in milk, deducting the first forty days.  
years old and over obtaining 32 points.

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	Days in Milk.	Milk Yield.	Butter Yield.	Butter Ratio.	Points.
Gold Medal to 'Sharab' ..	104	lbs. oz. 46 14	lbs. oz. 2 10½	lbs. 17·64	48·90
Silver Medal to 'Red Maple' ..	205	38 18	2 4½	17·18	48·25
Bronze Medal to 'Syndie's Thorn' .. .. . }	114	34 14	2 7½	14·08	47·15

"The averages of the three medal cows are as follows, showing what can be accomplished by careful selection and breeding:—

	Days in Milk.	Milk Yield.	Butter Yield.	Butter Ratio.	Points.
Three Medal Cows averaged ..	141	lbs. oz. 40 3	lbs. oz. 2 7½	lbs. 16·26	48·10

The English Guernsey Cattle Society offered prizes for English-bred cows or heifers, entered, or eligible for entry, in the Society's Herd Book, obtaining the greatest number of points by the practical test of the churn, the points to be reckoned on the weight of butter, and an allowance for lactation to be made under the scale settled by the English Guernsey Society.

"Only five animals competed for the prizes—rather a small muster, considering the number, all of which appeared to be good dairy animals, exhibited in the other Guernsey classes.

"The cattle were stripped on Thursday, the 23rd instant, at 5 P.M., the milk of the next twenty-four hours being taken for the test. The milk was separated at 90° Fahr. on Friday evening, a Farmers' Alpha Turbine Separator being used. Churning commenced on Saturday morning at 7.32, and the awards were published in the afternoon.

"The prizes were won by the following animals:—

"First prize, Silver Cup, Mr. Plumptre's 'Muriel 6th.' Second prize and Silver Medal, Mr. Parsons' 'Lady Langton.' Third prize and Bronze Medal, Mr. Plumptre's 'Gulnare 4th.'

"The averages of the five animals tested are as below:—

	Days in Milk.	Milk.	Butter.	Butter Ratio.	Points.
Five Guernseys .. .. .	83	lbs. oz. 34 5½	lb. oz. 1 8½	lbs. 22·42	28·74

No. in Catalogue.	Exhibitor.	Name of Cow.	Breed.	Date of Birth.	Date of last Calf.	Number of Days in Milk.	Milk Yield.		Butter Yield.
							Morning.	Evening.	Total.
							lbs. oz.	lbs. oz.	lbs. oz.
598	Earl of Ashburnham .. ..	Lady Myrtle ..	Guernsey	Nov. 22, '94	Feb. 25, '01	88	16 2	13 0	29 2
604	Hon. Mrs. A. Baillie Hamilton	Jessie 11th ..	"	June 30, '95	Dec. 8, '00	167	9 12	7 10	17 6
607	J. D. T. Parsons .. ..	Lady Langton	"	Jan. 15, '96	Mar. 1, '01	84	23 2	19 12	42 14
608	H. F. Plumptre .. ..	Muriel 6th ..	"	Dec. 14, '94	April 16, '01	38	24 6	19 10	44 0
609	H. F. Plumptre .. ..	Gulnare 4th ..	"	Feb. 6, '94	April 16, '01	38	21 10	16 12	38 6

(CHURNING TABLE.)

No. in Catalogue.	Name of Cow.	Colour and Quality of Butter.		No. of Points for Lactation.	Total No. of Points.	Awards.	Time.		Temperature.	
		Ratio, viz. lbs. Milk to lbs. Butter.	Colour.	No. of Points for Butter.			Finished.	Began.	Dairy.	Churn.
							deg. a.m.	deg. a.m.	deg.	deg.
598	Lady Myrtle ..	24 52	Excellent	19-00	4-80	23-80	8 8	7 34	56 34	52 55
604	Jessie 11th ..	18 53	Excellent	15-00	12-00	27-00	8 10	7 32	56 38	52 55
607	Lady Langton	25 17	Excellent	27-25	4-40	31-65	8 5	7 35	56 30	52 54
608	Muriel 6th ..	21 01	Excellent	33-50	..	33-50	7 55	7 38	56 17	52 55
609	Gulnare 4th ..	22 12	Excellent	27-75	..	27-75	8 5	7 40	57 25	52 54

## MILKING TRIAL PRIZES.

"The milking trial prizes were awarded as follows:—

## CLASS 99.—COWS OF ANY BREED OR CROSS UNDER 900 LBS. LIVE WEIGHT.

	No. of Points.
First prize, Dr. H. Watney's 'Sharab' .. ..	53·27
Second prize, the Hon. Mrs. Murray Smith's 'Lorna' ..	52·07
Third prize, Dr. H. Watney's 'Syndic's Thorn 2nd' ..	42·29

## CLASS 100.—COWS OF ANY BREED OR CROSS, 900 LBS. LIVE WEIGHT AND OVER.

	No. of Points.
First prize, Mr. J. Evens's Lincoln Red Shorthorn ..	60·50
Second prize, Mr. J. Innes' Shorthorn (unnamed) ..	60·37
Third prize, Lord Braybrooke's 'Dewberry' .. ..	53·05

"The arrangements for carrying out the trials were, as usual, satisfactory, and special thanks are due to the Stewards, the Rev. A. T. Boscawen, Mr. A. F. Somerville, and also to the Misses Jenkins, Benjafield, and Channon, who assisted in the dairy work."

XIX.—*The Society's Dairy and Farriery Schools.* By THOS. F. PLOWMAN, Secretary and Editor.

## CHEESE SCHOOL—TEACHING SECTION.

A CHEESE School has been carried on by the Society during the past year, on behalf, and at the cost, of the Somerset County Council, at Hambridge Farm, near Taunton, the occupier being Mr. J. Manfield.

The usual arrangements were made with the tenant for the use and control of his dairy, the supply of milk from his cows, and the boarding and lodging of Students in his house. The School, as in previous years, was supervised by Mr. G. Gibbons, the Society's Dairy Schools' Steward, and the teacher was Miss Emma Cannou.

The table opposite shows the number of Students at the Society's Cheese Schools from the date of their establishment until the present time.

The table on page 194 shows the quantity of cheese made in 1901, and the prices realised; Messrs. Hill Bros., of Evercreech, being as usual the buyers.

County.	Centre.	No. of days School was open.	Year.	No. of Students.							
				5 weeks.	4 weeks.	3 weeks.	2 weeks.	10 days.	1 week.	Shorter Periods.	Total.
Somerset..	Wells .. ..	184	1890	..	5	1	6	..	51	28	91
" ..	Frome .. ..	229	1891	..	12	1	12	..	32	9	66
" ..	Axbridge ..	214	1892	..	14	..	5	2	16	2	39
" ..	Butleigh ..	214	1893	..	24	..	3	..	15	2	44
" ..	Mark .. ..	214	1894	..	16	..	4	..	22	1	43
" ..	Haselbury ..	214	1895	..	30	..	..	..	8	4	42
" ..	Cossington ..	214	1896	1	10	..	3	..	8	..	22
Dorset ..	{Milton (near Gillingham)}	209	1896	..	22	1	3	..	6	..	32
Somerset..	Long Ashton	214	1897	..	16	..	5	..	4	..	25
" ..	ditto.	214	1898	..	19	1	1	..	14	2	37
" ..	Pylle .. ..	214	1899	..	10	..	6	..	17	5	38
" ..	Batcombe ..	219	1900	..	16	..	3	..	16	..	35
" ..	Hambridge ..	214	1901	..	12	..	2	..	3	..	17
		..	..	1	206	4	53	2	212	53	531

Since the establishment of the Butter and Cheese Schools in 1888 and up to the end of 1901, the Society has, in conjunction with County Councils and other public bodies for whom it has acted, expended the sum of 27,498*l.* in the promotion of technical instruction in dairying through the medium of these Schools. Even this sum by no means represents the total expenditure, for it does not include the cost of hiring and fitting up buildings for the travelling Butter Schools, and other liabilities undertaken by local bodies—such as the County and District Committees—co-operating with the Society.

The School will be re-opened for the season of 1902 on April 1st, at Mark House, Mark, near Highbridge. The premises, which are in the occupation of Mr. John Peters, are suitable and commodious, and there is ample provision at the residence attached to the farm for the comfortable boarding and lodging of Students. The School was successfully held at this farm in 1894.

The farm is four miles distant from Highbridge railway station, and Mr. Peters will arrange for a vehicle to meet the train if Students will communicate with him beforehand. The charge per journey, either way, will be 2*s.* for one Student, and 1*s.* 6*d.* each for more than one on the same journey.

Miss Emma Cannon, whose make of cheese at last year's School was excellent, will continue to be the teacher.

Date.	Place.	Number of Draft.	Weight of Green Cheese.	Weight of Cheese when sold.	Total Weight of Cheese sold.	Shrinkage.	Average age of Cheese when sold.	Price per 112 lbs.	Milk used.	Average Price per 112 lbs. of the year's output.
			cwt. qrs. lbs.	cwt. qrs. lbs.	cwt. qrs. lbs.	per cent.		£. d.	galls.	£. d.
1901	Hambridge	First (April 1 to 30)	33 0 9	30 2 4	273 0 19	6	13 weeks	60 0	8,678	64.2
"	"	Second (May 1 to 31)	52 2 22	48 3 23		7	13 "	63 0	5,746	
"	"	Third (June 1 to July 14)	74 0 12	68 3 0		7½	15 ,	64 0	8,091	
"	"	Fourth (July 15 to Aug. 31)	63 1 23	59 3 3		6	14 "	65 4	6,992	
"	"	Fifth (Sept. 1 to Oct. 31)	69 2 14	65 0 17		6½	13 "	63 0	6,670	
		Total .. ..	292 3 24	273 0 19					31,172	

The fees (payable in advance) are as follows :—

	Residents in Somerset.			Non-Residents.		
	£	s.	d.	£	s.	d.
For the first week (with board and lodging) .. ..	1	10	0	2	0	0
" second week " " .. ..	1	7	6	1	15	0
" third week " " .. ..	1	2	6	1	10	0
" fourth week " " .. ..	1	0	0	1	1	0
Fee for complete Course of four weeks .. ..	5	0	0	6	6	0

Day Students (at a charge of 10s. 6d., including board) will be admitted only when the class for longer periods is not full.

Students who have previously attended the School for not less than a month are admitted at a reduced fee of 5s. for one day's instruction ; 4s. per day for any other period less than a week ; 25s. per week for any other period less than a month, and 4l. for one month. For day Students these fees include board, and for all other Students board and lodging.

The School will be closed for the season on October 31st, 1902.

The Somerset County Education Committee has arranged to offer twenty Studentships, tenable at the School, of the value of 2l. 10s. each, being half the fee for a full course of four weeks' instruction, with board and lodging, and under very exceptional circumstances the fee may be still further reduced. Applications respecting Studentships should be made to Mr. C. H. Bothamley, Director of Technical Instruction, Weston-super-Mare.

At the Society's Annual Exhibition, which opens on May 27 next at Plymouth, Prizes (particulars of which will be found on page cx. of the Appendix to this volume) will be given for Cheese made by Students who have attended any of the Society's Schools since 1898.

#### FARRIERY SCHOOL.

The Travelling Farriery School, which had been carried on by the Society for the Somerset County Council since 1895, was discontinued on March 31st, 1901, the County Council having decided that it had sufficiently fulfilled the object for which it was instituted.

That the pupils had profited by the instruction given has been shown by independent local testimony, and also by the prizes they have won in many public competitions, including those held in connection with the Society's Annual Shows. The lectures given by the veterinary surgeon attached to the School were also well attended and much appreciated.

At the conclusion of a certain number of courses in a district,

a competition was held, open exclusively to pupils from the classes, and, in order to encourage regularity of attendance, only those who had attended at least eight times were entitled to compete.

A competition for those pupils who had attended a complete course of instruction at the School during its stay within the district comprising Banwell, Brent-Knoll and Bridgwater, was held at Bridgwater on March 29th, 1901. There was also an extra class open to pupils who had attended any of the Society's Farriery Schools. Among those present on behalf of the Society were Colonel G. Best, Farriery Steward, Mr. Thomas F. Plowman, Secretary, Mr. G. H. Elder, M.R.C.V.S., the Veterinary Surgeon attached to the School, and Mr. W. B. Blackall, Farriery Instructor. The Mayor of Bridgwater and others interested in the proceedings also attended. Mr. T. Aubrey, F.R.C.V.S., of Bath, acted as judge and examiner.

Thirty-one smiths competed, of whose work the Judge reported most favourably, and the following were the awards:—

**CLASS I.—HARNESS HORSES. (Seven competitors.)**

1st prize.—William Sugg, Chilton-super-Polden, Bridgwater.

2nd prize.—H. Quick, Combbick, Bridgwater.

3rd prize.—G. D. Welland, Cossington, Bridgwater.

Reserved.—H. Spurlock, 20, Camdem Road, Bridgwater.

**CLASS II.—CART HORSES. (Six competitors.)**

1st prize.—G. Herrin, Clare Street, Bridgwater.

2nd prize.—J. Martin, Angel Crescent, Bridgwater.

3rd prize.—J. Ridge, North Petherton.

Reserved.—J. Martin, Weston Zoyland, Bridgwater.

**EXTRA CLASS.—HUNTERS. (Eighteen competitors.)**

1st prize.—C. Cook, West Monkton, Taunton.

2nd prize.—F. Weaver, Paul Street, Taunton.

3rd prize.—W. Welland, Berrow, Burnham, Somerset.

Reserved.—C. Broomfield, Cemetery Road, Gillingham, Dorset.

Certificates were also awarded to the prize-winners and commended competitors.

The Judge said that he had never seen better work at any of the many competitions at which he had judged, and it was so good in the extra open competition that he highly commended the whole class.

As this was the last competition in connection with the School, all the competitors dined together at the end of the day, in order to take a formal farewell of the Instructor (Mr. Blackall), who had been with the School since it was first started in 1895. The Mayor of Bridgwater (Mr. Thompson) presided, and was supported by the Society's officials already

named and by other gentlemen. The Mayor, on behalf of the smiths, presented Mr. Blackall with a parting gift in the shape of a handsomely-mounted walking-stick as some acknowledgment of the trouble he had taken to make them proficient. Colonel Best, as Steward, and Mr. Plowman, as Secretary, bore testimony to the services which both Mr. Elder, the Veterinary Surgeon, and Mr. Blackall, had rendered the School.

The accompanying Table shows the places visited and the number of pupils at each since the starting of the School.

Centre.	Year.	School		No. of Pupils.	Total No. of Pupils each year.
		Opened.	Closed.		
Taunton .. .. .	1895	April 8	Aug. 5	32	71
Wellington .. .. .	"	Aug. 7	" 31	7	
Milverton .. .. .	"	Sept. 2	Sept. 14	3	
Wiveliscombe .. .. .	"	" 16	Oct. 25	12	
Williton .. .. .	"	Oct. 28	Dec. 6	12	
Dunster .. .. .	"	Dec. 9	" 20	5	
Allerford .. .. .	1896	Jan. 6	Jan. 17	5	
Bridgwater .. .. .	"	" 21	March 14	13	
Nether Stowey .. .. .	"	March 16	April 10	8	
Kilve .. .. .	"	April 13	" 24	5	
Wells .. .. .	"	" 27	June 2	7	92
Glastonbury .. .. .	"	June 3	" 16	2	
Ashecott .. .. .	"	" 17	" 30	4	
Osicott .. .. .	"	July 1	July 14	4	
Langport .. .. .	"	" 15	Aug. 29	10	
Ilminster .. .. .	"	Aug. 31	Sept. 26	7	
Chard .. .. .	"	Sept. 28	Oct. 9	5	
Crewkerne .. .. .	"	Oct. 12	Nov. 14	10	
Martock .. .. .	"	Nov. 16	" 28	4	
Yeovil .. .. .	"	" 30	Dec. 23	8	
Castle Cary .. .. .	1897	Jan. 11	Jan. 23	2	69
Shepton Mallet .. .. .	"	" 25	Feb. 6	2	
Oakhill .. .. .	"	Feb. 8	" 20	4	
Frome .. .. .	"	" 22	March 13	6	
Radstock .. .. .	"	March 15	" 29	1	
Bath .. .. .	"	" 29	May 10	10	
Cutcombe .. .. .	"	May 18	July 3	8	
Bridgetown .. .. .	"	July 5	" 17	3	
Dulverton .. .. .	"	" 19	" 31	5	
Highbridge .. .. .	"	Aug. 3	Aug. 21	4	232
Weston-super-Mare .. .. .	"	" 23	Oct. 2	9	
Banwell .. .. .	"	Oct. 4	" 16	3	
Yatton .. .. .	"	" 18	Nov. 12	6	
Wrington .. .. .	"	Nov. 15	Dec. 8	6	
Flax Bourton .. .. .	1898	Dec. 13	Jan. 15	6	
Bedminster .. .. .	"	Jan. 17	Feb. 5	3	
Winford .. .. .	"	Feb. 7	March 5	6	
Carried forward ..				..	232

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Centre.	Year.	School		No. of Pupils.	Total No. of Pupils each year.
		Opened.	Closed.		
		Brought forward ..	..	..	232
Chew Magna .. ..	1898	Mar. 7	Apr. 2	6	
Temple Cloud .. ..	"	Apr. 4	" 20	2	
Timsbury .. ..	"	" 26	May 6	3	
Cheddar .. ..	"	May 16	June 3	3	
Mark .. ..	"	June 4	July 8	4	
Burnham .. ..	"	July 11	" 23	4	
Bridgwater .. ..	"	" 25	Sept. 3	10	
North Curry .. ..	"	Sept. 5	" 17	2	
Somerton .. ..	"	" 19	" 30	4	
Langport .. ..	"	Oct. 6	Nov. 19	10	
Curry Mallett .. ..	"	Nov. 21	Dec. 17	8	
					71
South Petherton ..	1899	Jan. 2	Feb. 3	2	
Ilminster .. ..	"	Feb. 6	" 25	5	
Crewkerne .. ..	"	" 27	March 25	6	
Yeovil .. ..	"	March 27	April 22	6	
Ilchester .. ..	"	April 24	May 6	4	
Nether Stowey .. ..	"	May 15	June 3	4	
Kilve .. ..	"	June 5	" 17	2	
Williton .. ..	"	" 19	July 15	8	
Roadwater .. ..	"	July 17	Aug. 5	5	
Dunster .. ..	"	Aug. 7	" 20	4	
Wiveliscombe .. ..	"	" 21	Sept. 23	8	
Wellington .. ..	"	Sept. 25	Oct. 14	5	
Taunton .. ..	"	Oct. 16	Dec. 23	18	
					77
Wells .. ..	1900	Jan. 8	Jan. 20	1	
Glastonbury .. ..	"	" 22	Feb. 10	3	
Evercreech .. ..	"	Feb. 12	March 5	3	
Bruton .. ..	"	March 6	" 17	2	
Castle Cary .. ..	"	" 19	April 7	3	
Wincauton .. ..	"	April 9	" 18	0	
Milborne Port .. ..	"	" 23	May 11	4	
Upper Weston .. ..	"	May 14	" 29	4	
Bath .. ..	"	" 29	July 7	6	
Keynham .. ..	"	July 9	" 21	2	
Bedminster .. ..	"	" 23	Aug. 7	3	
Cathay .. ..	"	Aug. 8	" 25	3	
Nailsea .. ..	"	" 27	Sept. 28	5	
Clevedon .. ..	"	Oct. 1	Oct. 8	2	
Yatton .. ..	"	" 9	" 27	3	
Weston-super-Mare ..	"	" 29	Dec. 18	10	
					54
Bauwell .. ..	1901	Jan. 2	Jan. 18	4	
Brent-Knoll .. ..	"	" 21	Feb. 5	3	
Bridgwater .. ..	"	Feb. 6	Mar. 30	12	
					19
			Total ..	..	458

XX.—*The Society's Exhibition at Croydon.* By THOS. F.  
PLOWMAN, Secretary and Editor.

THE Society's 1901 Exhibition at Croydon was opened on Wednesday, May 22, and closed on Monday, June 4.

A plan showing the situation and arrangement of the Yard will be found facing the title-page of this volume.

ANNUAL MEETING OF MEMBERS.

At the Annual General Meeting of Members, held on the third day of the Show, in the Council Pavilion, the following Report of the Council was received and adopted :—

Since the last Annual Meeting of the Society a great sorrow has overshadowed the land, and the Society, in common with the rest of the nation, has mourned the loss of the most beloved and most illustrious of Sovereigns.

In the first month of the New Year the Council addressed the Members as follows :—

“ For the first time in the long history of the Society, its two highest offices—those of Patron and President—are this year held respectively by the Son and the Grandson of the Sovereign. The affection with which both the Heir-Apparent and the Duke of York are regarded by the whole Nation, renders such a connection with the Society doubly gratifying to all of us.”

When these words were penned there was little thought that within a few days there would be so sorrowful a need for their revision, and that he who had endeared himself to the Empire as Prince of Wales would be standing “ in that fierce light which beats upon a throne.”

But in this succession the nation, in its hour of mourning, found its highest consolation, for, as the surest hopes spring out of past fulfilments, it could look forward with confident assurance to the maintenance, in the fullest sense, of those glorious traditions which have rendered the late reign memorable for all time.

The Council very heartily congratulate the Members upon the honour recently conferred upon the Society by His Majesty, who has been graciously pleased to accept, as King, the office of Patron which, as Prince of Wales, he had held since 1864. Such a recognition of its past work will be the greatest possible incentive to the Society to persevere in its efforts, commenced more than a century and a quarter ago, for the advancement of “ Agriculture, Arts, and Manufactures.”

His Royal Highness the Duke of Cornwall and York has been

good enough to convey to the Council, in very kindly-expressed terms, how much he regrets that he is unable to preside over the Croydon Meeting.

Whilst the Society must share this regret to the full, at the same time it cannot but rejoice at the cause of His Royal Highness's absence, in view of the great benefit which must ensue to the Empire at large from his visit to the Colonies, and the strengthening thereby of the ties which bind them to the Mother Country.

The Council is much indebted to His Royal Highness for nominating as his representative so good a friend to the Society as the Earl of Cork and to his lordship for accepting the responsibility.

The conflict in which the Nation has been engaged has not left the Society unscathed, and the Council have especially to deplore the loss of an active member of their body and a gallant soldier, Colonel Helyar, who died fighting for his Queen and country in South Africa.

Death has also deprived the Council of the services of Sir A. W. Need.

The Council rejoice to welcome back to their midst and to the duties of his stewardship Mr. E. H. Llewellyn, M.P., who, with his four sons, has rendered good service to the Empire during the war.

During the past year the Council have continued their efforts for the promotion of Technical Education in Agriculture by organising and conducting, on behalf of the Somerset County Council, a Cheese and a Farriery School.

The Council have also followed up the practical and scientific investigations, initiated by the Society a few years since, in connection with Cider-making, the experience of previous years having fully satisfied them of the value of these researches. The Board of Agriculture has once more borne testimony to the utility of the work by awarding a grant in aid of it. Particulars of the results obtained have been published in the recent issue of the Society's Annual 'Journal.'

The experiments upon the improvement of grass land, which were set on foot in 1895, are still in progress.

The Council are also conducting, in conjunction with the Board of Agriculture, an experiment for ascertaining the influence of various manures upon the production of mutton. The Council believe that such an experiment is likely to be an extremely useful one.

The Council, with the co-operation of the Board of Agriculture and the Somerset County Education Committee, are about to carry out a scheme having for its object the investigation of the origin and cause of flavour in dairy produce, the cost of which will be defrayed by annual grants for three successive years of 200*l.* from the Board of Agriculture, of 100*l.* from the Somerset Committee, and of 150*l.* from the Bath and West Society.

The Council congratulate the Members upon once more visiting Croydon after an interval of more than a quarter of a century, the

Show being last held there in 1875. The cordiality with which the Society has been welcomed by the town and neighbourhood on the present occasion induces a hope that so long a period may not elapse between the present and the next visit. The Local Committee have done all in their power to make the meeting a success, and the thanks of the Society are due to them for their efforts.

The present Show is the largest of Live Stock and Produce that the Society has ever held, and its extent may be judged by the following statement, showing the total number of entries :—

Horses	..	..	..	..	..	..	..	310
Cattle..	..	..	..	..	..	..	..	633
Sheep ..	..	..	..	..	..	..	..	188
Pigs ..	..	..	..	..	..	..	..	136
Poultry	..	..	..	..	..	..	..	374
Produce	..	..	..	..	..	..	..	212
								<hr/>
								1,853

In addition to the above-named entries, there are 243 entries in the Butter-making, Shoeing, and Milking Classes.

For the first time, Jumping Competitions have been added to the prize list, and there is a most satisfactory entry in these classes.

In the belief that the drying and evaporation of fruit and vegetables is a subject deserving of more attention than it has hitherto received in this country, the Council have arranged for an exhibition of appliances, and lectures to illustrate these, during the Croydon Meeting.

In the Implement and Machinery department 5,592 feet run of shedding, and 19,235 square feet of open space have been allotted, which satisfactorily compares with previous Shows.

The Council have gratefully to acknowledge the receipt of special prizes from the Croydon Local Committee, the Kent and Surrey County Councils, the Croydon Borough Council, the Shire Horse Society, the Hunters' Improvement Society, the Hackney Horse Society, the English Jersey Cattle Society, the English Guernsey Cattle Society, the Red Polled Cattle Society, the Breeders of Sussex Cattle, the English Kerry and Dexter Cattle Society, the Shorthorn Society, the English Aberdeen-Angus Cattle Association, the Southdown Sheep Society, the National Pig Breeders' Association, the British Berkshire Society, the Large Black Pig Society, Captain Best, R.N., Sir James Blyth, Bart., Sir W. Gilbey, Bart., Professor Carroll, and Mr. G. E. Lloyd-Baker.

The Council have accepted a very cordial invitation to hold the Annual Meeting in 1902 at Plymouth.

The Council have much pleasure in recommending that the Earl of Morley be elected President for the ensuing year. Also that the Duke of Beaufort, the Duke of Marlborough, and Lord Fitzhardinge, be elected Vice-Presidents of the Society; and that the gentlemen named on the Agenda Paper be elected Members of Council for the years 1901-1903, in room of those retiring by rotation.

In conclusion, the Council would earnestly impress upon every Member of the Society the desirability of making an effort to increase the roll of membership, by bringing under the notice of others, especially those interested in the land, the advantages the Society offers. The increasing demand upon its funds resulting from the additional work which, in the direction of experiment and research, it has in recent years taken upon itself, renders it more than ever necessary that its income should be fully maintained. But, beyond this, an increasing membership affords substantial evidence of vitality, which is in itself a source of influence and strength.

## ENTRIES.

The following is a comparative statement of the entries in the Stock and Produce classes in 1894 (when the Society previously visited Surrey), 1900, and 1901 :—

	Guildford, 1894.	Bath, 1900.	Croydon, 1901.
<b>HORSES :—</b>			
Agricultural .. .. .	55	52	67
Hunters, Hacks, Ponies, Harness and Jumping .. .. .	55	172	243
	— 110	— 224	— 310
<b>CATTLE :—</b>			
Devons .. .. .	35	32	28
Shorthorns .. .. .	50	89	76
Herefords .. .. .	40	45	42
Sussex .. .. .	58	22	33
Jersey .. .. .	172	148	158
Guernsey .. .. .	68	72	78
Kerry and Dexter .. .. .	16	33	36
Red Polled .. .. .	..	22	24
Aberdeen Angus .. .. .	11	..	54
Dairy .. .. .	20	53	104
	— 470	— 516	— 633
<b>SHEEP .. .. .</b>	238	141	188
<b>PIGS .. .. .</b>	..	135	136
<b>POULTRY .. .. .</b>	430	349	374
<b>FARM PRODUCE :—</b>			
Cheese .. .. .	97	130	65
Butter and Cream .. .. .	109	139	94
Cider .. .. .	..	96	53
Miscellaneous .. .. .	17	..	..
	— 223	— 364	— 212
<b>Total .. .. .</b>	<b>1,471</b>	<b>1,729</b>	<b>1,858</b>

A list of the Awards, names of the Judges, &c., will be found on pages i.-lxxv. of the Appendix to this volume.

# CIDER.

A separate Report dealing with this section of the Exhibition will be found on pages 150-167.

# PRIZES.

The following Table shows how the money prizes were apportioned at the 1894, 1900, and 1901 Exhibitions:—

	Guildford, 1894.			Bath, 1900.			Croydon, 1901.		
	£	s.	d.	£	s.	d.	£	s.	d.
Horses .. .. .	536	0	0	877	0	0	846	0	0
Cattle .. .. .	1,221	10	0	1,206	10	0	1,242	10	0
Sheep .. .. .	525	0	0	428	0	0	387	0	0
Pigs .. .. .	..	..	..	205	0	0	245	0	0
Cheese .. .. .	145	0	0	118	0	0	109	0	0
Butter and Cream .. .. .	66	5	0	59	10	0	59	10	0
Butter-Making .. .. .	67	15	0	72	0	0	40	0	0
Milking .. .. .	..	..	..	11	5	0	11	5	0
Shoeing .. .. .	22	0	0	33	0	0	35	0	0
Poultry .. .. .	190	10	0	169	10	0	175	0	0
Shearing .. .. .	10	0	0	..	..	..	..	..	..
Miscellaneous .. .. .	46	0	0	..	..	..	..	..	..
<b>Total .. .. .</b>	<b>2,890</b>	<b>0</b>	<b>0</b>	<b>3,174</b>	<b>15</b>	<b>0</b>	<b>3,150</b>	<b>5</b>	<b>0</b>

The Money Prizes in 1901 were contributed as follows:—

	£	s.	d.
By the Bath and West and Southern Counties Society	2,823	15	0
" Croydon Local Committee .. .. .	115	0	0
" Shorthorn Society .. .. .	20	0	0
" Breeders of Sussex Cattle .. .. .	21	0	0
" Red Polled Cattle Society .. .. .	45	0	0
" English Aberdeen-Angus Cattle Association .. .. .	41	0	0
" English Jersey Cattle Society .. .. .	31	0	0
" English Guernsey Cattle Society .. .. .	2	0	0
" English Kerry and Dexter Cattle Society .. .. .	10	10	0
" British Berkshire Society .. .. .	5	0	0
" Large Black Pig Society .. .. .	20	0	0
" G. E. Lloyd-Baker .. .. .	3	0	0
" Captain J. C. Best, R.N. (Poultry) .. .. .	10	0	0
" Sir W. Gilbey, Bart. (Poultry) .. .. .	3	0	0
	<b>3,150</b>	<b>5</b>	<b>0</b>

Gold, Silver, and Bronze Medals were also given by the Society, and Medals or Plate by the Shire Horse Society,

the Hunters' Improvement Society, the Hackney Horse Society, Sir J. Blyth, Bart., the English Jersey Cattle Society, the English Guernsey Cattle Society, the Southdown Sheep Society, and Professor Carroll.

#### IMPLEMENTS.

The following is a comparative statement of the number of feet run of Shedding provided for Implements, Machinery, &c., and of the number of square feet of open space occupied by exhibits unsuitable for Shedding:—

	Guildford, 1894.	Bath, 1900.	Croydon, 1901.
Agricultural Implements .. .. feet run	4,595	2,941	3,395
Machinery in Motion .. .. "	1,106	1,022	630
Seeds, Cattle Foods, Artificial } Manures, &c. .. .. "	880	1,068	842
Carriages and other Exhibits not } strictly Agricultural* .. .. "	840	735	725
Total feet run .. .. "	7,421	5,766	5,592
Open Space for Farm and Horti- } cultural Buildings, &c. .. .. sq. feet	10,681	19,475	19,235
Total .. .. "	18,102	25,241	24,827

#### MISCELLANEOUS DEPARTMENTS.

A fully equipped Working Dairy, in which the Butter-making Competitions were held, formed as usual a prominent feature of the Show. Here various dairy implements and appliances—including power and hand separators—were shown at work, and the best methods of making butter and clotted cream were practically demonstrated. By arrangement with the Kent and Surrey County Councils, who made a monetary grant for the purpose, the testing of milk for quality and of whey for acidity was illustrated by experts.

In a Pavilion, specially erected for the purpose, there was an exhibition of appliances to illustrate the drying and evaporation of fruit and vegetables, with explanatory lectures and demonstrations by Mr. J. Harper, particulars of which will be found on pages 89–107 of this volume.

\* Since 1891, the Society has felt it necessary to considerably restrict the exhibition of Miscellaneous goods; hence less space has been allotted to this Section.

There were also Shoeing and Milking Competitions, and Exhibitions of Pictures, Art Manufactures, Flowers, Bees, and Bee Appliances. The customary Art Union was held, and a list of the prize winners and of the pictures chosen will be found on pages lxxvi., lxxvii. of the Appendix to this volume.

COMPARATIVE STATEMENT OF ENTRIES FOR COMPETITIONS  
FOR MEN AND WOMEN.

—	Guildford, 1891.	Bath, 1900.	Croydon, 1891.
Butter-Making .. .. .	190	136	138
Shoeing .. .. .	57	106	87
Shearing .. .. .	7	..	..
Milking .. .. .	..	24	18
	254	266	243

Musical performances were given by the Bands of the Coldstream Guards, the Scots Guards, and the Royal Marines (Portsmouth Division).

The usual Sunday Service, at which there was a large attendance of herdsmen and others engaged in the Yard, was held in the Working Dairy. It was conducted by the Society's Chaplain (the Rev. Canon Quirk), who was assisted by the Rev. A. J. Easter, Vicar of St. Matthew's, Croydon, the Sermon being preached by the Bishop Suffragan of Dover.

The first of the following tabular statements refers to the number of persons who paid for admission to the Show Yard, and the second to the admission receipts:—

Number of Admissions.	Croydon, 1875.	Guildford, 1891.	Bath, 1900.	Croydon, 1901.
At 7s. 6d. (Season) .. .. .	291	171	347	421
„ 5s. .. .. .	..	..	587	756
„ 2s. 6d. (Children) .. .. .	..	..	29	23
„ 2s. 6d. .. .. .	13,515	8,024	10,910	8,858
„ 1s. (Children) .. .. .	716	492	682	500
„ 1s. .. .. .	23,723	26,750	33,287	27,148
„ 6d. (Children) .. .. .	2,301	3,047	3,527	3,545
Total .. .. .	40,546	38,484	49,369	41,251

	Croydon, 1878.	Guildford, 1894.	Bath, 1900.	Croydon, 1901.
Show Yard .. ..	£ 3,077 19 6	£ 2,505 8 0	£ 3,430 17 6	£ 2,928 0 6
Horse Ring Stand	77 2 6	77 16 0	94 10 6	365 13 0
Working Dairy ..	..	17 17 0	10 17 0	6 0 6
	£ 3,155 2 0	£ 2,601 1 0	£ 3,536 5 0	£ 3,299 14 0

A comparative statement of attendances since 1852 will be found on pages lxxxix., xc. of the Appendix to this volume.

XXI.—*Annual Report of the Society's Consulting Chemist*  
(Dr. J. A. VOELCKER, M.A., F.I.C., &c.).

TEN samples were sent me during 1901 by Members of the Society, as against nine the previous year. These comprised:—

Basic Slag	..	..	..	..	..	2
Bone-meal	..	..	..	..	..	2
Rice-meal	..	..	..	..	..	1
Waters	..	..	..	..	..	4
Soil	..	..	..	..	..	1
Total	..	..	..	..	..	<u>10</u>

The two samples of Basic Slag analysed as follows:—

	A.	B.
	per cent.	per cent.
Phosphoric acid	17·89	17·36
Equal to phosphate of lime	39·05	37·89
Fineness	80	71·4

Sample A was satisfactory, being of good quality and sufficiently finely ground; but B was somewhat deficient in fineness of grinding. Care should be taken, in purchasing Basic Slag, to get a guarantee of the fineness as well as of the phosphates, and a fineness of 80 to 90 per cent. should be asked for.

The two samples of bone-meal were satisfactory, and worth the prices paid. One—a sample of “steamed” or “degela-

tinised" bone-meal—was decidedly cheap. It analysed as follows :—

Moisture .. .. .	25·26
*Organic matter .. .. .	9·53
Phosphate of lime .. .. .	57·30
Carbonate of lime, &c. .. .. .	7·06
Sand .. .. .	·85
	<hr/>
	100·00
	<hr/>
*Containing nitrogen .. .. .	1·08
Equal to ammonia .. .. .	1·31

The price of this, in April, 1901, was 3*l.* 17*s.* 6*d.* per ton, which must be called very moderate.

The rice-meal sample was a very good one, giving 14·28 per cent. of oil, with no excess of fibrous matter. A practice, it may be pointed out, has sprung up of late, of grinding up and mixing with the genuine rice-meal the husks previously removed from the grain.

It is remarkable that not a single sample of linseed-cake nor of cotton-cake has been submitted for analysis. A note on decorticated cotton-cake is desirable, in view of the frequent instances that I have recently met with of a deterioration in the manufacture of this valuable feeding material. It is becoming more and more the practice to have an excess of husk in the cake, or even to grind up and remix the removed husk with the decorticated (or husk-removed) meal. This is shown in an excess of fibre in the cake and lowering of nitrogen and oil, the quality of the cake being thereby deteriorated. A genuine decorticated cotton-cake should not have more than 3 to 4 per cent. of woody fibre and about 7 per cent. of nitrogen.

All the four samples of water sent me were free from sewage or harmful contamination; but three, owing to the presence of vegetable matter in excess, of suspended clayey matter, or of matters arising from recent construction of a well, required filtration before they could be considered satisfactory drinking supplies.

The sample of "soil" forwarded was the product of burning the top surface of heath or moorland and soil, and it was thought that this burning would probably produce a material containing an appreciable amount of potash. The quantity of potash found, however, did not exceed ·13 per cent.



XXII.—*Annual Report of the Society's Consulting Botanist*  
(Mr. W. CARRUTHERS, F.R.S.).

THE Consulting Botanist has attended to several inquiries from Members of the Society. Mixtures of seeds supplied for short and for permanent lays have been analysed. A mixture giving a full amount of the best grasses for permanent pasture in fair proportions was supplied to a Member. It contained 20 millions of seeds to the acre, at a cost of 20s. The ingredients were the following:—

5 lbs. Timothy.  
2 lbs. Rough stalked Meadow-grass.  
7 lbs. Cocksfoot.  
5 lbs. Meadow Fescue.  
2 lbs. Meadow Foxtail.  
3 lbs. White Clover.  
 $\frac{1}{2}$  lb. Yarrow.

A weed which was overrunning a pasture field, and observed to be very abundant in the South of England, was determined to be a Hawkweed, a species of *Crepis*. Its spreading leaves, close on the ground, prevent other plants getting possession of the soil, or even holding possession when they have got it. It is rejected by stock, and, as it flowers and fruits freely, it multiplies rapidly. It should be prevented from seeding by being cut down when in flower. In some places, where it is very abundant, it would be better to break up the pasture, to take one or two crops of roots off the field with the view of thoroughly cleaning it, and then lay it down with suitable seeds.

In consequence of the increased knowledge of the better elements required, and the possibility of obtaining true and pure seeds from seedsmen, the production of a good pasture by seeding is now much more certain than formerly.

A field of winter wheat belonging to a Member produced four-fifths of soft brome-grass (*Bromus mollis*). This grass is foolishly asserted to be a degeneration of the wheat. It is not likely that the seed wheat contained so large a proportion of brome seed without being noticed by the farmer. It must have come from the seeds of a former crop in the same field, or have been blown on to the wheat field from some neighbouring pasture. The soft brome grass is an annual plant, and with care should easily be got rid of.

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## The Note-Book.

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### Preservatives and Colouring Matters in Dairy Produce.

—A Departmental Committee was appointed by the Local Government Board in July, 1899, to inquire into the use of preservatives and colouring matters in the preservation and colouring of food, and to report as to whether such materials are injurious and to what extent they are used.

The Committee has now reported, and as this Report will probably be the foundation of legislation which may materially affect farmers, we purpose to give the Recommendations of the Committee, some details as to the grounds on which they based these recommendations, and a few critical remarks on the subjects generally.

### RECOMMENDATIONS.

These are as follows :—

(A.) That the use of formaldehyde or formalin, or preparations thereof, in food or drinks be absolutely prohibited, and that salicylic acid be not used in a greater proportion than 1 gr. per pint in liquid food and 1 gr. per pound in solid food. Its presence in all cases to be declared.

(B.) That the use of any preservative or colouring matter whatever in milk offered for sale in the United Kingdom be constituted an offence under the Sale of Food and Drugs Act.

(C.) That the only preservative which it shall be lawful to use in cream be boric acid or mixtures of boric acid and borax, and in amount not exceeding 0·25 per cent. expressed as boric acid. The amount of such preservative to be notified by a label upon the vessel.

(D.) That the only preservative permitted to be used in butter and margarine be boric acid or mixtures of boric acid and borax, to be used in proportions not exceeding 0·5 per cent. expressed as boric acid.

(E.) That in the case of all dietetic preparations intended for the use of invalids or infants, chemical preservatives of all kinds be prohibited.

(F.) That the use of copper salts in the so-called greening of preserved foods be prohibited.

(G.) That means be provided either by the establishment of a separate Court of Reference or by the imposition of more direct obligation on the Local Government Board to exercise supervision over the use of preservatives and colouring matters in foods, and to prepare schedules of such as may be considered inimical to the public health.

#### CONCLUSIONS

We may now consider some of the conclusions to which the Committee came, and upon which they base these recommendations.

104. As regards the injurious action of preservatives, the Committee say "the medical evidence, speaking generally, comprises for the most part opinion."

105. Physiological experiments did not appear to "imitate with sufficient exactness the actual conditions obtaining."

106. "A factor still more subtle in its influence upon the question before us is idiosyncrasy. Certain individuals are extremely sensitive to certain drugs, and it appears that among these drugs must be reckoned, at least, one of the agents used as a preservative." An individual possessing an idiosyncrasy with regard to the poisonous action of boracic acid would not be able to profit even by his own experience, because the addition of this substance to foods is not declared.

Here we see the grounds for two of the Committee's recommendations, viz., prohibiting the use of formalin, and suggesting that when other preservatives are used their presence shall be declared.

109. "Compounds of boracic acid have not been proved to be more hurtful than saltpetre to the consumer, yet saltpetre has been used from time immemorial in curing bacon, &c."

Here we have the reason for the selection of boracic acid in recommendations C and D. It is, however, a curious fact that no recommendation is made regarding the use of these preservatives in bacon, &c. Surely this is an omission which ought to be remedied. We find—

110. "Boracic acid or borax . . . are used in the curing of hog products, ham having been found to contain amounts

varying from 4 to 24 grains per pound, and bacon from 2½ to 8½ grains per pound."

We now pass to the conclusions arrived at by the Committee as they affect dairy produce, which we may quote verbatim :—

112. After very carefully weighing the evidence we have come to the conclusion that as regards the trade in fresh and cured meat, fish, butter, margarine, and other food substances in the consumption of which but small quantities of the antiseptic are taken into the system, there exists no sufficient reason for interfering to prevent the use of boron preservatives. Even butter, of which the imports from all countries except Denmark frequently contain boracic acid, is not consumed in such quantities by individuals as to convey more than a very moderate daily amount of the drug into the system. The evidence satisfies us that the amount of preservative corresponding to 0·5 per cent. of boracic acid is sufficient for the purpose of preserving butter.

113. But the circumstances and conditions affecting the milk traffic are very different. Milk, a very perishable substance, peculiarly liable to bacterial contamination, forms a very large proportion of the daily food of the public. The nutrition of infants and young children depends greatly on the purity and abundance of the milk supply; and, seeing how frequently milk is prescribed for invalids and convalescents, it is of the utmost importance that it should not be the vehicle of any unsuspected agent. While it is possible that milk containing boracic acid in sufficient quantity to act as a preservative (say 30 grains to the gallon) might be consumed to the amount of four or five pints a day, without harmful results by most healthy children or adults, there is evidence pointing to an injurious effect of boracised milk upon the health of very young children.

114. Moreover, there exists at present no guarantee against the addition of excessive amounts of preservative to milk. In 1896 the Medical Officer of Health for Birmingham estimated the amounts of boracic acid in a number of milk samples. Of these, one-half showed boracic acid in a proportion not exceeding 21 grains per gallon; in one-fourth the proportion varied between 21 and 42 grains per gallon; while in the remaining fourth it ranged from 42 up to 126 grains per gallon. Professor Blyth instanced a sample of milk, purchased in Marylebone, containing boracic acid in the proportion of no less than 80 grains to the pint. This occurred in December, 1899, and the witness assured

us that from time to time he had found an equally high proportion in milk samples taken in summer

115. Clearly such random use of any drug in a food calls for regulation. At present milk may be subjected to several successive treatments with preservative before it reaches the consumer. The farmer or producer sometimes applies it, so does the wholesale purveyor, so does the retail dealer; lastly, the domestic use of preservatives is increasing, and has become very general, and hence the milk may receive a fourth dose before it reaches the unsuspecting consumer.

116. There is this further objection to the use of preservatives in the milk traffic, that they may be relied on to protect those engaged therein against the immediate results of neglect of scrupulous cleanliness. Under the influence of these preservatives milk may be exposed without sensible injury to conditions which otherwise would render it unsaleable. It may remain sweet to taste and smell and yet have incorporated disease-germs of various kinds, whereof the activity may be suspended for a time by the action of the preservatives, but may be resumed before the milk is digested.

117. It has been put before us that it is not possible to supply large towns, especially London, with new milk without the aid of preservatives; but we have received abundant evidence to prove that this is no more than a matter of organisation and system. No doubt the prohibition of preservatives in milk offered for sale would tend to the disadvantage of small retailers who have no cold storage, but this is not a consideration which should stand in the way of a much-needed reform.

As to the feasibility of conducting the traffic in the largest towns without preservatives we have no doubt whatever. In Denmark the use of all preservatives in milk is strictly prohibited, and the prohibition is stringently enforced. Much of the milk consigned from the country to Copenhagen is conveyed in ice wagons, or wagons otherwise specially adapted for the traffic, the property of purveying companies in the capital.

118. It has been estimated that about 50 per cent. of the dairymen of London use preservatives. One of the largest dairy companies in London (Welford Dairy Company, Limited) declined to furnish us with any information; but evidence was given by another large company (the Aylesbury Dairy Company, Limited) that they used no preservative whatever, either in milk, cream, or butter.

119. Even more conclusive of the practicability of supplying the metropolis with milk unmixed with preservative was the evidence of Mr. T. Carrington Smith, who, during a series of several years, consigned milk to London from Mid-Staffordshire, a distance of 126 miles, under a contract which prohibited him from the use of preservatives. The milk was carefully strained and cooled by means of water, precautions which the witness pronounced indispensable, and there never was any trouble from the milk going sour. Mr. Smith, who appeared on behalf of the Royal Agricultural Society, handed in letters from farmers sending the milk of from 500 to 1,500 cows daily to London from Faringdon and Didcot, without the use of preservatives.

120. In face of these facts we are of opinion that it is idle to pronounce it impossible to supply London with milk not artificially preserved. The business would be attended with some inconvenience at first, but we are impressed with the need for facing that inconvenience, and for rendering the vendors of milk containing preservatives subject to penalties under the Sale of Food and Drugs Act. Obviously the conditions under which milk is sometimes kept in the homes of the poor is likely to hasten the processes of decomposition, but we do not think this a sufficient argument in favour of the sale of chemically preservatives milk.

121. In regard to cream the question is somewhat different. We are of opinion that, under present conditions, it would be difficult to maintain or increase the present supply of cream without the use of some preserving agent. The presence of a preservative is less objectionable in cream than in milk, because cream is usually consumed in much smaller quantities than milk; but inasmuch as cream is now often prescribed for invalids and children instead of cod-liver oil, we consider that the obligation should be laid on the vendor of cream of notifying the presence, nature, and quantity of the preservative.

122. One of the considerations which render it expedient to prohibit the use of any preservative in milk offered for sale, namely, the large quantity which may be taken into the system of the consumer, places, in our opinion, wine, cider, and temperance beverages upon a very similar footing. Moreover, while by far the greater proportion of preservatives used in the dairy industry consists of compounds of boron, a substance without any active toxic properties, it is otherwise with fermented and temperance drinks. The usual preservatives in these articles are salicylic acid and

formaldehyde, and although the quantity of each actually required is very small, it is often largely exceeded.

128. There is such a wide choice of colouring matters suitable for the dairy trade, that no inconvenience would arise from restricting it to the use of innocuous substances as these may be defined and permitted in the manner hereafter suggested. But the same reason which we have given for the prohibition of preservative in milk offered for sale, namely, the large quantity thereof which may be consumed by an individual, appears to render it highly undesirable that any colouring matter should be permitted in milk. There is this further consideration, that milk is sold as an absolutely raw, unmanufactured article, of which the purchaser is entitled to be aware of the natural colour, and to draw his own conclusions therefrom as to quality.

129. In the butter trade and still more so in the cheese trade artificial colouring has long been established. Highly-coloured goods find favour in some markets, uncoloured or faintly-coloured goods in others. We have not found that in the interest of the consumer any interference is necessary with the customs of the trade in this respect.

130. In regard to margarine, we have to deal with a cheap and relatively inferior article invariably coloured to resemble a more costly and superior article, and probably the only means of protecting the public from imposition would be to prohibit the introduction of any colouring matter into margarine which shall cause it to resemble butter. Be the regulations as to the sale of margarine under declaration what they may, they cannot protect the customer who calls for bread and butter at a hotel or restaurant from being served with bread and margarine, and paying for it at the rate charged for the superior article. But as the margarine may be assumed to be a perfectly wholesome article of diet, it does not fall within the terms of our reference to make any recommendation upon a practice which is not attended with risk to the public health.

Such are the conclusions of the Committee and the recommendations based upon them.

The following points seem to be deserving of careful consideration, having regard to the great importance of the mature formation of public opinion upon the matter, and the need of ample discussion of it before actual legislation takes place.

The first is why should cream be allowed to contain only half the quantity of preservative permitted in butter? Butter

is a manufactured article which, when well made, should have been deprived by washing of all those constituents which tend to promote change or decay. A good butter will not contain 1 per cent. of such matter. Cream, on the other hand, is a substance naturally containing in very large proportion the constituents, milk-sugar, casein, and albumin, most prone to change, and such constituents cannot by any known process be removed from the cream. Hence, it would have been more reasonable to expect that a larger percentage of boracic acid should be allowed in cream than in butter. The argument that cream is used by invalids is of no avail. Legislation must be for the majority of the people, and the amount of cream used by invalids in large towns can only be a very small proportion of the total consumption. By invalids cream free from preservatives could be specially obtained always, though the cost would be considerable; but the present recommendation, if adopted, would probably ruin the present trade in potted cream, and then neither invalids nor the general public would be able to obtain such cream, and an industry which has of late years been of very considerable help to dairy farmers would probably be destroyed.

An even far more reaching and may be, for a time, disastrous effect would follow the prohibition of preservatives in milk. That this is an end to be aimed at we may grant, but it would necessitate such a revolution in the milk trade that to enforce it at once would be disastrous. In conclusion 117 the Committee point to the milk supply of Copenhagen. But ice in Denmark is as easy to obtain as fog in London, and the Danish railways carry the milk in "ice wagons." If the Committee would, at the same time as they prohibit the use of preservatives in milk, make it compulsory for the railway companies to carry the milk in "ice wagons," no farmer and no dairyman would complain of the prohibition. But taking conditions of transit as they are in this country, the frequent scarcity of water for refrigerating purposes in many districts from which milk is now sent, and the peculiar heat and exceptional atmosphere of London during many days of July and August, and it is quite certain that even if the milk arrived at the London terminus other than curds and whey, it would probably be curds and whey before it could be consumed. Even in the best houses of the middle classes, so difficult is it to keep milk during such days, that the whole is scalded the moment it is delivered, and this practice is under medical advice spreading gradually to that supplied at all seasons. But it must not be forgotten that milk, even if very slightly acid, will curdle when scalded, and it would be far better, as a preventive of the diarrhoea so prevalent among young children in

the poorer districts, where conditions suitable for keeping milk sweet do not exist at all, that the milk should contain a preservative and be scalded, rather than that it should be free from preservative and drunk in an unscalded and semi-acid condition.

#### CIDER.

It will be noticed that recommendation A permits the use of 1 grain of salicylic acid per pint of liquid. In their Report the Committee state—

124. "We have not given our attention to the prevalence of preservatives in beer, . . . but in the manufacture of cider we found that the employment of salicylic acid is very general, both in the native and imported article."

It will be remembered that the experiments at Butleigh have conclusively proved salicylic acid not to be necessary as a preservative of cider, while Mr. Lloyd, in his Report in the 'Journal' for 1898, warned cider-makers; that if they "wished to compete with the cider now being imported, most of which contains preservatives," they must trust to cleanliness and care, and "not to preservatives." It is to be regretted that the Committee would allow the use of salicylic acid in cider; it will only help to handicap one more home industry with foreign competition.

**Nature Knowledge.**—There has recently been a considerable increase in the number of books or pamphlets intended for imparting an elementary knowledge of agriculture, or of drawing the attention of children in rural districts to the object lessons which daily surround them. Some of these have been received for notice in this 'Journal'; but we regret that careful examination has led us to believe either that the writers do not possess adequate knowledge of their subject, or lack the literary skill necessary to properly place such knowledge before children.

Some writers seem to think that second-hand knowledge is sufficiently good for children, and they quote the books to which they are indebted, but which often are inaccurate compilations. Hence they repeat statements without knowing whether they are accurate or not; use them as a mechanic might a tool which he had never had in his hands before.

One reason for this is that writers are not content merely to treat subjects which they do know and can admirably deal with; but they must needs drag in others which they do not know, and which consequently ruin their books. We have one

such in mind. Many of the chapters are admirable, interesting, instructive, easily expressed, and tending to promote observation. Yet later on in this same book a chapter will be found dealing with dairying, which is crowded with errors. It will be well to quote some few of these, to show that the preceding remarks are justified.

The author says, "cream is highly-condensed milk." Now, even in country villages, "condensed milk" is not an unknown commodity, and there are probably few rural schools where the difference between it and cream would not be understood.

In describing a separator, it is said, "the separated milk runs out of one tap, while the cream runs out of another." As a matter of fact, there are no taps at all.

The object of churning is "to mix air" with the butter globules. This is the reverse of what is required; the result of mixing air with cream would be to produce whipped cream, than which nothing is more unchurnable.

The effect of rennet is described thus: "The curd at first appears as little flakes or grains, and, by working with the hands, these flakes or grains begin to increase in size until they become a solid mass that you can cut with a knife." One can imagine the laughter with which such a sentence would be received if read at a school in any cheese-making county of England.

Of all the essentials of science teaching absolute accuracy is the first, and without it a work is worse than useless. For not only does it fail to impart knowledge, but, by the ridicule which it justly promotes, it hinders all progress and augments a feeling already too prevalent among the agricultural community, and not without good reason, that many men who write about agricultural matters do not understand their subject.

The second fault which we have noticed in such literature is the "infantile" manner in which the knowledge is expressed. Boys and girls resent this. They should be taught to feel that they are growing into little men and women, and that the time has come when they should seek knowledge for themselves. The teaching which simply says "look and you shall see" is of very little avail. Teach them how to look, then let them describe what they see, and if, as is certain, much has escaped their notice, then show them how to observe.

Of the literary faults, one of the most striking is the attempt to be poetical or figurative. It takes a genius like Tennyson to poetically describe or utilise Nature, and those who wish to write in this style might well and carefully study his poems. Even then it is doubtful whether the mind of a boy or girl would properly understand the subject matter. It is far better

to be simply descriptive. We recently read in a nature knowledge leaflet that when the spring comes buds "make up their minds to burst," and that a tree "was talking about" its leaves. Such metaphorical language only gives a false impression to children.

On the other hand, descriptive writing needs precise language; and when within forty lines of print we find "those things to see about," "a shining thing," "pairs of things," "funny little things," and "the things," we cannot help wondering what precise idea any child could hope to attain from such loose description. This is not the way either to impart nature knowledge, or to increase, as we all desire to see increased in rural districts, the interest of the children in the beauties and wonders of Nature among which they dwell.

**Wool.**—Mr. J. B. Simpson, writing in the 'Mark Lane Express Almanac,' makes some interesting remarks on the wool industry.

During the nineteenth century there were some remarkable fluctuations in the value of wool, culminating in the commencement of the last quarter of the century in the record price of 2s. 6d. per pound. That was the palmy day of the sheep-breeder so far as wool was concerned, but a few years later, in the early eighties, the value of the fleece had somewhat declined. And the decline which then set in has, with slight temporary fluctuations, been continuous, with the result that in the year of grace 1901 all modern records have gone, and wool has changed hands at a price hitherto unknown to the present generation.

The causes for the long retrogression are not difficult to ascertain. The development of our Australian colonies, and the opening up of Argentina and other districts of South America, will account for a part of that ruinous decline which has been so prejudicial to the British farmer. A great part of our Australian colonies is adapted only for sheep-farming, and is now as purely pastoral as England was in the earlier Tudor period; and the produce of the flocks of the colonies is mainly sent here for conversion into the goods of commerce.

Against the competition of mere quantity the British sheep-breeder could contend in some degree. But, unfortunately, there is a further and far more difficult factor to be taken into account. At one time our English wool was considered to be the best for manufacturing purposes, and was in the highest demand; but a new order of things has arisen, and British wool now ranks low down in the scale. There has come over the markets a great demand for woollen materials of a lighter nature, and so our coarse woolled fleeces, from a pound of which

a thread of about three-quarters of a mile in length can be spun, have had to give place to some of the finer Down wools, from which a thread of twenty miles in length can be drawn ; and the best Down wool ranks much below some of the finest colonial Merino wool, from a pound of which a thread nearly a hundred miles long can be obtained. English fashion has declared unmistakably for the finer and softer wools, and consequently our native productions, with their broader and coarser staple, have gone to the wall.

The last twenty years has also seen a marked change in the public taste for mutton. Two or three decades back, the fatter the sheep the more valuable it was, and the artisans and mechanics of our large towns would readily purchase the fattest mutton for their consumption. As such sheep are now unsaleable, the breeder has had to produce an animal of a different class, a sheep of larger frame with flatter sides, better legs, smaller development of the shoulders, and a carcass yielding generally a larger proportion of flesh and a smaller proportion of fat. The long-woolled races of sheep were, generally speaking, those which produced the fatter mutton, such as the Leicester, the Border Leicester, the Lincoln, and the Cotswold. To produce a carcass of mutton more in demand by the public many long-woolled breeders crossed their flocks with Down rams, and thus obtained sheep that were in great demand by the butcher. But the thing was overdone, the markets were overcrowded with Down crosses, and during the past year these cross-bred wools have been practically unsaleable. It seems that so far as the Down cross is concerned, the result is that both the quality of the wool and the quantity are adversely affected. During the last year there was some little revival in the demand for long wools and lustre wools, and these were able to command a much higher price than the cross-bred wools just alluded to.

The question naturally arises, What is to be the future of sheep-breeding in England ?

In any attempt to gauge the position there are two factors which must not be overlooked, and which are of the greatest moment : the first of these is the fact that the British farmer aims mainly at the production of mutton, while the foreigner aims mainly or entirely at the production of wool. With the British farmer the fleece is a subsidiary consideration, because the value of the carcass is so much greater than the value of the fleece, while to the colonial breeder the carcass has scarcely any value whatever. Secondly, the finest wool can only be produced in hot, dry climates, and our insular climate is much too moist for the purpose. Another consideration too generally overlooked is, that in the colonies the sheep is essentially a wild

animal, and as such provides for itself; here the sheep is more or less domesticated, especially when kept on arable land, and the high feeding and forcing necessary to early maturity and early marketing do not tend to the production of the finer wool. It seems, therefore, hopeless to attempt to compete with the foreigner in the quality of the wool; but, on the other hand, it is fully admitted that the foreigner cannot produce mutton of the quality we can produce at home. So it seems that the aim of the English farmer will be to produce sheep yielding mutton of the highest quality and attaining maturity at the earliest date, and to regard the quality of the fleece as a minor matter. If he does this, he will probably aim more and more at an increased weight of fleece, and so recoup himself for what he loses in the quality. There is yet another matter to be taken into account—the changes in fashion—which are capricious and frequent. Whether the present demand for light wool will continue no man knoweth, but there is an indication to the contrary, and the small but certain increase in the price of lustre wools during the past autumn seems to point to some change.

**Feeding and Management of Dairy Cows.**—Mr. John Speir recently in a lecture on the above subject said, that if milch cows of a good type are selected, and properly treated, they will give a good return, but if they are not properly kept the result will be disappointing. Farmers cannot be too particular in the selection of cows for the production of milk, particularly when the milk is to be manufactured into butter, and it is much more profitable to pay a full price for a good milking cow than have an indifferent one for nothing. If only heifer calves from the best milking cows were kept for milking purposes, four gallons of milk might be produced at the cost of every three now yielded by most herds. In this respect a valuable lesson was learned from their keenest competitors the Danes, who twenty-five years ago were not dairy farmers at all; they were advised by their experts to weigh the milk of every cow night and morning, to keep a record of it, and only to keep heifer calves from their heaviest milking cows. This expert advice was followed, though some thought it unnecessary, and at the present time there are few Danish farmers who could not give the annual yield in their herds for several generations back. The result was that probably no cows in any country had such a high average yield as those in Denmark. The time occupied in the labour of weighing the milk was trifling, and in the end it has proved of the utmost value.

As an example of what had been done by selection and

breeding, the late Mr. E. C. Tisdall told him that when he was purchasing the best heifers he could get, their average yield for the first ten years of his experience was 426 gallons per annum. Heifer calves were kept from the best of these, and in a short time the average of the heifers was 600 gallons in the year, and in 1896, the end of the third period of ten years, he had ten heifers which averaged 800 gallons in one year. Mr. Tisdall also told him that the system of feeding was practically the same throughout.

The selection of the bull to mate with the cows was also a point of importance, because the bull would regulate not merely the milk of one cow, but would influence for good or bad that of every animal bred from him. It was, therefore, most important that every stock bull kept for service in a dairy herd should be out of the very best milking cow procurable.

Their attention should also be directed to keeping cows whose milk contained a high percentage of butter-fat. They should not delude themselves with the idea that if they had cows giving plenty of milk, all they required to do in order to get plenty of butter-fat was to feed them well. By all means feed them well; but they might rest assured that no amount of feeding would raise the percentage of fat in the milk of a cow which gave naturally poor milk to equal that of a cow whose produce was naturally rich. Two cows might quite easily produce the same quantity of milk in the year, yet when that milk was turned into butter, the one cow might have produced 100 lbs. more butter than the other. That was not all, for the cow which had the 100 extra lb. of butter had probably not cost any more to keep than the other.

When the cow came to within a fortnight of calving, she should be brought into the house and kept there till she calved. This was particularly necessary if food was abundant, and especially so after midsummer, and during early autumn. After being brought into the house, the cow should receive two or three mashes of bran and treacle daily, with a little hay, and what water she cared to drink. After the cow calved she should not be milked completely dry for several days. A little milk could be taken away as often as one liked, but only just a little to relieve the udder. Until a week after calving the udder should never be completely emptied—the object of this was to prevent milk fever. In winter, cows in calf should be put out every day for a little exercise, fresh air, and what green food could be picked up on the pastures. If any grass was to be had, then plenty of good hay was all that was required in addition. If no grass was available a

few turnips, potatoes, or cabbage served to keep the bowels in good order.

The cow should not be put out for several days after calving, and subsequently only for a short time. This was to be particularly attended to during the autumn and winter, and cows calving during this period were better kept in the house for some time, feeding sparingly for the first ten days, and using bran and hay as the principal foods. Having spoken on the desirability of giving dry food to cows on pasture when inclined to scour, he pointed out that a high percentage of fat in milk was to be got by breeding, and not by feeding. If, however, the cow is thin in flesh, it may not give its normal quantity of milk. Under-feeding would not only reduce the live weight of the animal, but also the total butter production. On the other hand, there was very little evidence to prove that excessive feeding would materially increase the percentage of butter-fat in the milk.

**Potato Planting.**—A writer in the '*Agricultural Gazette*' recently said: Many growers of potatoes have curious fancies, most of which appear to be entirely without satisfactory foundation. Some insist that better results are obtained from cut than from whole seed tubers, from a single eye rather than from several eyes, from the seed end, or conversely from the stem end, or from seed laid with the cut surface upwards instead of downwards. With regard to one of these fancies, as to the stem end of the potato being planted, while the seed end is thrown away, Mr. H. H. Boardman, in the *Rural New Yorker*, refers to some experiments carried out for six consecutive years by Mr. Edmund Hersey, of Hingham, Massachusetts, which showed that the seed-end plants were more than double the size of the stem-enders on the same dates. Every year of the six the seed-enders started in advance and kept ahead of the stem-enders. Now for the results:—"The seed end produced (in one year) of large potatoes, 4 lb. 8 oz., and 1 lb. 10 oz. of small; total, 6 lb. 2 oz. Stem end produced of large potatoes 4 lb. 4 oz., and of small 1 lb. 2 oz.; total 5 lb. 6 oz. For six years the ten hills of each produced—seed end, 166½ lb. of large potatoes and 47½ lb. of small; total 213½ lb. Stem end produced 141½ lb. of large potatoes and 47½ lb. of small; total 188½ lb.—the seed end producing 25 lb. more large potatoes than the stem end, and about the same quantity of small potatoes. Rate per acre, seed end, 408½ bushels; stem end, 358½ bushels." Mr. Hersey summarises the results of his experiments as follows:—"Years of close observation and careful experiments lead me to the following conclusions:—Whole potatoes will produce a crop from a week to ten days

earlier than cut potatoes. Small whole potatoes will produce for many years in succession just as good, if not better results, than large potatoes cut the size of the small whole ones. The seed end of a potato is better to plant than the stem end, because the plants start with more vigour, and produce larger and more potatoes. A large piece of a potato is better to plant in ordinary soil, and will produce a much better crop than very small pieces or single eyes."

A correspondent subsequently wrote to the 'Agricultural Gazette' as follows:—"My experience this season fully confirms the opinion of the American writer quoted in your last issue, to the effect that whole seed potatoes will produce a crop from a week to ten days earlier than cut potatoes. In my garden I have two rows of the same selected lot of potatoes, treated exactly the same, except that whole large potatoes were set in one row, and tubers of the same class, cut into two or three pieces, in the other. Both rows were set on the same day; yet the tops from the whole seed are four times as big as those from the cut seed. The former had to be earthed up on May 29th, whereas the latter will not be forward enough for earthing until at least a week later. Neither of these rows was manured, as they happened to be the unmanured rows against which two trials of differently manured rows are being made. But in another case, in a manured row, some of the sets were whole and others cut, and the difference between the development of the tops is as striking as in the first case.

**How to make Farm Work Attractive.**—"The clods of the valley shall be sweet unto him." Can it be said that these words apply to the English field labourer of to-day? Here and there, undoubtedly, men are to be found who take pleasure in their work; their heart is in it; they are content with their wages; and, when their day's work is over, the cottage home, with its garden, orchard, and pasture, is a pleasant resting place, and provides substantial comforts of a kind that are usually out of the reach of town workmen. There is a freshness and flavour about home-grown fruit and vegetables that is usually absent in marketed produce. The garden, the poultry, the cow, and pigs not only provide household food abundantly, but the cultivation of the ground and the care of the stock are duties that every member of the family can take part in. The afternoons spent in the hayfield or in collecting bracken for bedding, or, it may be, with the shepherd, helping to tend young lambs or bringing sheep up to be shorn, are not the least happy in a boy's career. The home life of children in a cottage of this type is a valuable training—wherever they receive due

consideration and encouragement. The care of stock creates attachment to stock, and makes animal life interesting. It is the same with fruit, vegetables, and flowers. Children who take part in the lighter duties of garden work, provided they also get a fair share of play, and particularly if they have a corner of the garden that they can call their own, frequently develop a love for plant life that never leaves them. Some children take more readily to stock and some to soil cultivation. It seldom happens, where children are brought up in a country home such as I have described, that they fail to take kindly to farm or estate work when their school days are over. When the time comes that a lad has to decide whether to earn his living near home by farm work or to seek employment in some other industry, we may be sure that if he has been happy in his home life he will be influenced to a considerable extent by his father's views. If the village schoolmaster has not only been the lad's teacher, but also his friend, his opinion, too, will have weight. Boys who a year or two earlier were the lad's school-fellows and playmates, and to whom he looked up, will be consulted, and their experience of their several callings—be they farm lads, clerks, or shop boys—cannot fail to influence, in some measure, a decision that now concerns a wider circle than formerly. Country-bred lads are usually practical, and are gifted with a fair share of common sense; but they lack experience. With the help of their parents and friends they naturally decide to work where the prospect is apparently the most promising. When thousands of lads year after year, and these, too, the brightest and most handy, forsake the land, we may be sure that the farming interest must suffer. The chief duties of the shepherd and the cattle-man can never be performed by machinery. Implements have not brains. The most perfect machinery and implements are alone helpful to the farmers when they are handled by skilful workmen.

How is it that a large proportion of the lads whose services are sorely needed by farmers quit the land? A remedy cannot be applied with any prospect of success until the malady is thoroughly understood. It has been said times out of number that the boys do not enter the service of farmers because nowadays they are over-educated. I believe this to be a great mistake. Many of the border shepherds are better educated than thousands of men who have twice their income. One reason why the lads turn their backs on the country is because the great book of Nature, full as it is to overflowing with interest and knowledge of the highest order, has at school, till quite lately, been in most places a closed one.

The observing powers of village children have often been

neglected. Their eyes, ears, and hands, possessions worthy of the most careful training, have at many schools received far too little attention. The schoolmaster, not infrequently, is unfitted for his post as a teacher of country lads. His heart is not in the country. The Board of Education are fully alive to "the importance of making the education in the village school more consonant with the environment of the scholars than is now usually the case." In Circular 435, addressed to managers and teachers of rural elementary schools, dated April, 1900, are these words: "One of the main objects of the teacher should be to develop in every boy and girl that habit of inquiry and research so natural to children. . . . Teachers should lose no opportunity of giving their scholars an intelligent knowledge of the surroundings of ordinary rural life and of showing them how to observe the processes of Nature for themselves. . . . This sort of teaching will, it is hoped, directly tend to foster in the children a genuine love for the country and for country pursuits." The whole circular from which these brief extracts are taken is full of admirable suggestions.

Would that all country schoolmasters had the ability and good sense of Mr. Bradley, whose school is at Stanbury, in the Yorkshire moorland district—where Charlotte Brontë lived. "Mr. Bradley is a naturalist. The school," said the *Yorkshire Post* lately, "is a museum of the plant and insect life of the country side. The children, from the eldest down to the youngest, can tell you something about the life-history of what is under their eyes daily growing and changing. They brought all these 'little wild things' to the school themselves, knowing where to find them in tiny egg and larva just as well as any field naturalist. On Friday afternoon the teaching is out of doors. Every small naturalist who finds a treasure, however inconsiderable, gets the right word of help about it. In other ways this delightful school is taught for country needs and interests. Geography begins with the visible hills and streams drawn from local maps and shaped in clay. Mr. Bradley has been at work in this way for several years; like the Greeks of old, his idea of education is to render body and mind as fit as possible for their special work in life; the storehouses of the boys that he teaches are filled with all pleasant knowledge. The power of observation—the most valuable that a country lad can possess—is developed to the utmost."

But, after all, we must remember that the home is the foundation stone of a lad's career. Let the school training be all that could be desired, the good seed sown will not result in the expected harvest unless the home life is fitted to develop the best side of the boy's character. Many landowners are fully alive to

the importance of providing the labourers on their estates with cottage holdings that supply every reasonable requirement. The higher wages of other industries empty comfortless country dwellings; but they usually appeal in vain to the man whose home is one that he can take pleasure in and is secure in. The cottage, with its garden and pasture, may be a stepping-stone to a small farm. Unfortunately there are thousands of dwellings occupied by farm labourers and their families that are not worthy to be called homes. Boys brought up in abodes of this kind have not a fair chance. All honour to those landowners who have brightened the lot of the labourers on their estates. Let us hope that those who have not will recognise the responsibility that is on their shoulders—if they do not they will live to regret it. It has been said by short-sighted apologists for neglect that capital invested in building good cottages for country labourers yields even less than the Funds. Can the men who make misleading statements of this kind say what return is obtained on capital invested in farm buildings, or in the farmhouse? The landowner who provides good homes for the farm labourers on his estate can always secure the best class of tenants for his farms, and much better farm-rents than those landowners obtain who have failed to fulfil their duty in this respect. There are many ways in which a farmer can, if he will, make the lot of his labourers more attractive. Let every man be encouraged to do his best, and let every man who works on the farm feel that his interests and those of his employer are one. The farmer who studies the well-being of his men, and does his best to promote their interests, can face difficulties that would daunt less considerate men. It is a mistake to suppose that men leave farm service in large numbers to throng the slums of the town. Some may eventually drift there, but the majority obtain remunerative employment on the railways and in the collieries, and as carters. Thousands, too, emigrate and build up homes in other lands, where there is no fear of the evening of an industrious life being passed in a workhouse. The landowners and farmers of England can outbid all other employers if they will—not by offering higher wages where wages are good, but by providing, wherever needed, homes for the agricultural labourers of England that meet every reasonable requirement.

**Agricultural versus Fancy Poultry.**—Mr. W. B. Tegetmeier, commenting upon this subject, in 'Vinton's Almanac,' says:—The statement made by Mr. Robinson, of the Utility Poultry Club, in his lecture on the French methods of poultry-keeping, which was delivered at the Crystal Palace during the late Poultry Show, might serve to indicate to English poultry

breeders the extreme difference between fancy and useful poultry. This gentleman, who had spent some time in a very large poultry-rearing establishment in France, stated the fact that no distinct breeds were employed in supplying the best fowls that went to the Paris market. He said that pure-bred Houdans, Crève Cœurs, and La Flèche, superior table fowl as these breeds are, were not in as great request or bred as largely as the common farmyard mongrels between Cochins, Dorkings, Houdans, and other breeds which have been dignified in this country by the name of Faverolles, and which the introducers are endeavouring to settle the points of as exhibition birds, and have at last decided that they should be salmon-coloured, five-toed, clean-legged, and with a distinguishing beard. Of course, Faverolles will be bred up to this so-called standard. They will not be selected for plumpness or quality for the market, but for fancy points; and as Houdans have been utterly spoilt as a useful fowl in England by the exaggeration of crest, so will these farmyard mongrels, which now supply the best table fowl in France, be spoilt as useful poultry as soon as they get into the hands of the fanciers.

The same is true in our own country. The large number of fowls which supply the best birds in the London markets are of no special breed whatever. They are sold as Surrey fowls, and, whether cocks or hens, the best of them are often termed capons, a name which is equally inapplicable to both sexes, as real capons are practically unknown in the market. These Surrey fowls are not recognised by the fanciers.

At the late Crystal Palace Show, as far as regards really useful birds, the Dorkings were the only satisfactory classes exhibited. These having no special fancy points, except the retention of the utterly useless fifth toe, have been bred for size and quality, and really were a grand exhibition of some 250 birds.

Taking the classes in succession, Spanish—notorious as the layers of large white eggs—fanciers have bred for enormously exaggerated combs, and ear-lobes seven or eight inches in length, so that the birds have become semi-blind, and are no longer in request, not one dozen pens having been exhibited. Cochins when they were first introduced were the best layers of any sitting varieties; they were not bred for laying, but for the abundance of feather and fluff. This has rendered the breed utterly useless as an agricultural fowl. Houdans have largely fallen off, as they have been bred, not as in France for prolificacy and plumpness, but for size of the feathered crest, which renders them ill-adapted for agricultural holders. Brahmas are exhibited in considerable numbers, and can only

be regarded by agriculturists as useful in giving large size when used for cross-breeding. There are a dozen classes for Game fowl of all colours, but these have nothing whatever to do with birds that are useful to the poulterer or for the practical purposes for which Game were formerly so much bred. Their qualities are extreme length of leg and neck and brilliancy of feather, the amount of breast meat being utterly ignored in the show birds, being only retained by the breed known as the Old English Game. Indian Game are now being bred solely for feather. The exceedingly useful Minorcas, as formerly seen in the farmyards of the South-West, are now reared for show, and this most useful egg-producer promises to follow its relative the Spanish into obscurity. The farmyard mongrel, the Plymouth Rock, which was introduced from America some years since, has, as many of our readers know, the capability of being a very useful all-round fowl, not, it is true, a first-rate market fowl for the table, but still of very great excellence. These, however, have now been bred of different colours. Leghorns, a term formerly applied only to a white breed, have now been crossed with Game, Cochins, and Minorcas, and are produced of almost every colour, the abundance of eggs not being the aim of the exhibitor. The so-called Orpingtons have been hitherto bred for size; but they have now been crossed with Cochins or Lincolnshire Buffs, so that we have now Buff Orpingtons, which have become fashionable.

One very useful class appeared at the Palace Show, the ordinary layer of many parts of Belgium, known as the Campine. This Campine is a large, strong, healthy fowl, an exceedingly good layer, and one which is largely used for the production of "petits poussins" on the Continent. Here it will probably be bred solely for plumage, &c.

Whatever poultry shows may have done for the extension of poultry-keeping amongst private individuals and fanciers, they have had no beneficial effect on the production of useful poultry for the table or for eggs. Our best egg-producers they have done very much to injure, inasmuch as the selection of breeding stock has never been, in this country at least, from the most prolific hens, but from those that showed the most desired pattern of comb, wattle, or feather.

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## The Farmer's Library.

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### NOTES AND REVIEWS OF NEW BOOKS.

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- 1.—*Hints to Young Valuers.* By Messrs. A. R. CRAGG and J. R. V. MARCHANT. London: The Land Agents Record, Limited. Price 25s.

VALUATIONS frequently form a part of the daily work of the land agent, surveyor, architect, and auctioneer, and, as the work of valuing is both lucrative and responsible, it is generally regarded as being the most important branch of each of those professions.

It is not, however, on this account that we draw attention to this second edition of a work which rapidly made its name among those for whom it was written. Rather is it because the subjects covered by the work appeal to a much wider circle, and few landowners or tenants can really afford to remain in ignorance of the main principles of valuation.

The book, which runs to over 1,000 pages, is in parts necessarily highly technical and in others somewhat legal. The section which would probably appeal to most of our readers is that on farm valuations, which, covering some 120 pages, is quite a complete treatise in itself. Yet, if we briefly show how the authors deal with such a subject, it will give a fair indication of their work as a whole.

“Valuations of this description include live and dead stock, tillages, crops, manures, unexhausted improvements, &c., and are usually made for the following purposes:—

- “1. For the preparation of the annual balance-sheet.
- “2. On change of ownership when the lands are in hand.
- “3. Between outgoing and incoming tenants.
- “4. For the purposes of the death duties;

and may be divided into two classes—viz., those which include the live stock and implements on farms, and those which do not comprise them, but which are confined to

tillages, crops, manures, &c., and are commonly known as 'tenant-right valuations.' The last-mentioned valuations may be either under the Agricultural Holdings (England) Acts, 1883 to 1901, or under the provisions of a lease, or by the 'custom of the country.' The provisions of the Agricultural Holdings Acts will be discussed hereafter, and the text of these Acts will be found in the Appendix. It is sufficient to state here that these Acts give a right of compensation to be fixed in cases of dispute by arbitration, under certain conditions and cases, in respect of certain specified improvements, which are divided into three classes: improvements (1) to which consent of landlord is required; (2) in respect of which notice to landlord is required; (3) in respect of which neither consent of or notice to landlord is required."

This opening paragraph to the chapter on Farm Valuations enables us to form an idea of the admirably systematic manner and the practical and thorough way in which each subject is treated.

Every aspect of valuation, both practical and legal, receives careful consideration at the hands of the authors. Whether it be the valuation of property as a whole, for rent, for sale, or for rating, or whether it be the consideration of special points, such as timber, building land, or artificers' work, the book is equally systematic, exhaustive, and clear; and we believe it will be found of very considerable value even to those who, if not valuers themselves, must needs at times employ others to value for them, and therefore ought to possess sufficient general knowledge to know that this work is carried out for them on systematic and reasonable lines.

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2.—*Mistakes in Orchard Management.* By JOHN ETTLE, F.R.H.S.  
London: Spottiswoode and Co. 1s.

THIS short but admirable essay on what not to do is reprinted from the 'Journal of the Royal Horticultural Society.' Mr. Ettle is well known to many of our readers, and his work can be commended to all interested in apple culture. We are surprised to find that there are any nurserymen so careless as to send out either trees or grafts suffering from American blight. Yet it would seem that such is the case. "I have seen several instances where American blight has been introduced with grafts from a nursery," says the author, and he points out that

while "it is comparatively easy to keep young trees clean in a nursery," yet, "when an infested tree is sent out to be planted among others the pest is quickly spread, and infests what may have been previously a clean plantation."

As remedies against the American blight, Gishurst compound, tobacco-water, and "Abol" are recommended, and instructions are given how and when to apply them. Young trees may be kept clean; but if the blight is constantly allowed to propagate, it may cost more to exterminate than the trees are worth.

The relation between landlord and tenant as regards orchards is next considered, and the author thinks, with reason, that "efforts to improve the orchards of the country will not be entirely successful until there is a better understanding between these two classes." The method of bringing this about is discussed, bearing in mind the fact that "the best produce alone pays now-a-days."

"The landlord providing trees and material, and the tenant the necessary labour," is the key-note to the proposed system; there are, however, many important details, for which we must refer readers to the original pamphlet.

Mistakes in planting, fencing, and pruning are next entered into. Every point is made clear, and numerous photographs are reproduced to illustrate the text. That all our readers would agree with the author on the subject of pruning is not likely; in fact, no two authorities seem to agree on this question of how to prune. There would appear to be a tendency to go to extremes. The older farmers will not prune at all, the younger prune too much. Mr. Ettle evidently tries to steer clear of these two extremes, at least, so far as the old trees are concerned. "With old orchards," he says, "a mistake is often made in giving trees too severe a pruning all at once. It is far better to do it in two or three instalments—say, at yearly intervals—as then there is not the same probability of giving too severe a check to the roots. The first year the lower or under branches, which are quite shaded by other branches above them, should be removed; the next year the shaded branches in the centre of the tree; and, if spread to the third year, the worst placed outer branches which are crossing each other, or which show a tendency to grow towards the centre." One side issue of the advantage of pruning by no means unimportant is not overlooked, for the author says, "The land under well-pruned trees is much more profitable than under the shaded ones, as the herbage is so much better."

The foregoing brief extracts will sufficiently indicate the practical character of this pamphlet, which we recommend to all those who possess orchards and wish to improve them.

3.—*The Feeding of Animals.* By W. H. JORDAN. London : Macmillan and Co.

WITH the exception of the experiments carried out in Germany to determine the scientific basis of economical feeding, no experiments can compare with those which have been made at the various Experiment Stations of the United States. This book being written by the Director of the New York Agricultural Experiment Station, we look to it to contain an epitome of this work, and also a broad consideration of its relation to the results obtained in Europe.

An Englishman, when he sets himself the task of writing a book, will often take infinite pains to discover and describe work done abroad, and yet entirely or almost neglect even better work which has been done at home, and which has in some instances preceded or even supplied the motive for the foreign investigations.

Evidently this is not the case with Americans. They recognise the good work done in their own country, are proud of it, and glad of the opportunity of spreading its repute and of increasing its influence.

Of books on the feeding of animals hitherto available to farmers, there were only two of any importance: one was a translation of Wolff's world-renowned German text-book, and the other, Dr. Armsby's 'Manual,' was based largely on Wolff's results, because when it was written there were few facts elsewhere obtained which he could utilise.

In the volume before us we have a new departure. Except in regard to those facts which may be said to constitute the common stock of scientific knowledge, the author depends for his information mainly on experiments which have been conducted in the United States. And this gives his work a distinct character and special value. It has its drawbacks and it has its faults. But in spite of these, which are small compared with the value of the whole, the book is of distinct merit, and will well repay the careful study of those interested in the feeding of animals.

As an illustration of the manner in which subjects are handled, we will select a few passages from the chapter dealing with that matter of perennial interest, milk production. The author says:—

"Milk, like all other animal products, is derived from the food. Its secretion stands almost unrivalled as an example of the rapid, extensive, and continuous transformation of the food into animal compounds. In no other

instance, except perhaps in the case of the earliest growth of animals, is so large a proportion of the digested nutrients utilised in building new material, or is there so intimate a relation between the extent and kind of the feeding, and the extent and character of the resulting product.

"There is no milk in an animal's food, that is to say, hay and grain contain no casein, butter-fat, or milk sugar.

"They do contain nutrients, which, when subjected to the vital processes of the animal, are ultimately transformed into the constituents of milk. The mammary gland is not a sieve, through which certain compounds in the blood are strained into the udder cavities, but it is a specialised tissue in which wonderful and extensive chemical changes occur. Here, for the first time, we find casein, the mixture of compounds known as butter-fat, and a sugar unlike any that is found in plants, or in any other part of the animal organism."

How great these chemical changes are is well shown by the following facts:—

"A cow yielding 6,000 pounds of average milk per year is not regarded as an unusual animal. This means, however, the annual production of not less than 780 pounds of milk solids, an amount at least double the dry matter in the body of a cow weighing 900 pounds.

"Still more striking is the case of high-grade cows yielding annually over half a ton of milk solids.

"No facts could more forcibly illustrate the necessity of liberal and proper rations for the milch cow."

The author then proceeds to consider what is the amount of food and the character of the ration suitable for milk production. He shows the necessity for a large proportion of nitrogenous matter in the ration; points out that "from the usual list of home grown feeding-stuffs it is difficult to make up a ration throughout an entire season" which shall be suitable. "A generous admixture of clover in the hay" and the use of peas will help, but, as a rule, "dairymen depend to some extent upon purchased" food. Having given advice generally, he warns his readers that "There is no single food, nor any one combination of foods, that is always best for dairy cows."

In the further consideration of this subject, we find the effect of the food on the milk treated with special ability. Regarding the question of the flavour of milk or butter, whatever causes it, says the author, "is generally present in such

minute quantities that even if the nature of the substance was known the determination of its amount would be beyond the skill of the chemist;" and then follows a suggestion which we do not remember ever having seen before, yet one worthy of consideration and investigation: "The superiority of June butter, if such exists, may be due to the almost imponderable volatile odours which are derived from the young grasses." We would suggest, however, that it may more probably come from the flowering rather than from the young grasses.

In some respects the book is disappointing. Any work intended for general readers should constantly endeavour to help them in their difficulties. Probably there are no subjects in connection with feeding, upon which the practical man is more in want of advice, than upon how best to purchase artificial foods and how best to estimate their relative value. To put before him all the difficulties which surround these questions is only desirable, provided that subsequently how to overcome them is explained. Unless some such practical method can be suggested, then these difficulties appeal only to the scientific reader; and in such case every quotation should give the reference to the original author's work, that students may examine the data for themselves.

Undoubtedly there is considerable difficulty in estimating, either commercially or scientifically, the relative values of various feeding stuffs. But because a perfect method has not yet been found, that is no reason why an approximate method should not be meanwhile adopted; and among such methods we know none better than that of Dr. König, which was fully described in the 'Journal' for 1891-2, vol. ii., p. 303. The omission we have mentioned is the chief fault we have to find with a work, which on the whole is most admirable.

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4.—*Farm Poultry.* By GEORGE C. WATSON. London: Macmillan and Co., Limited. 5s.

THE sub-title of this work is "a popular sketch of domestic fowls for the farmer and amateur." The author is Professor of Agriculture in the Pennsylvania State College, and he draws mainly on American experience for his facts. This, instead of detracting from the work, gives it rather a special interest, and results in a somewhat fresher treatment of the subject than is usual. The poultry industry in the United States is of no small importance. The author estimates that the value of the poultry

and eggs produced annually is nearly 250 million dollars, "considerably more than the total value of the coal, iron, and mineral oil produced in the United States for the same period" (1890).

The Directors of the Experiment Stations in the United States do not consider that the sole aim and object of all agricultural experiments is to test the value of manures, and several have devoted some special attention to subjects connected with poultry. The author cites the results of these experiments, and this gives additional value to his work for readers in Great Britain, to whom these experiments are in the main unknown. "Sound common sense" was the opinion expressed about this book by a lady who makes a successful hobby of poultry-keeping.

These three words admirably sum up the book which, from commencement to end, is practical. Moreover, it is well illustrated; the figures of various breeds of fowls being of quite exceptional merit.

The advantages of poultry-keeping are set forth in the first chapter. The first advantage, in the author's opinion, is that little capital is required. He says:—"To a person contemplating a new enterprise, or the extension of a business already established, one of the first questions to be solved is 'What will it cost?' It often happens that the original or first cost of an enterprise prevents persons of moderate resources from making what in their judgment would be a safe investment. Probably there is no important branch of animal industry that requires so little outlay in labour and money as poultry-keeping."

"Start in a moderate way, and delay long enough to learn the business thoroughly before much is invested," is the author's advice to those about to make their first attempt in poultry-keeping on an extensive scale.

The amount of land necessary is comparatively little; but even this must depend partly on the object in view, thus: "Fowls, like other classes of live stock, require more exercise while they are growing and developing, and do best in a large run or park, as so much depends on a strong body and constitution when the period of greatest usefulness is reached. It is of relatively more importance, therefore, to have a large run for the young and immature fowls than for the mature birds, which latter are being maintained solely for the production of eggs. Fattening fowls require comparatively little exercise; their health is not materially impaired by a short confinement, and more rapid gain in weight is secured by confining them."

"The rearing of young fowls for market demands more space, both in and out of doors, than a business of the same magnitude in which egg production is the chief object."

The author classifies fowls, as to their useful qualities,

into egg breeds, meat breeds, general purpose breeds, and fancy breeds, to each of which a chapter is devoted. Then follow chapters on buildings, both as regards location, construction, and internal arrangements; on the breeding and improvement of fowls; on feeding and on breeding, in which special attention is given to incubators. Ducks, geese, and turkeys are subsequently considered; then the preparing and marketing of poultry products; and, lastly, the diseases and enemies of poultry. An extremely useful book, is the opinion which we have formed of it, after frequent reference to its pages.

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5.—*Basic Slag: Its Origin, Uses, and Effects.* By J. PETERS.

THIS pamphlet is issued by the Chemical Works interested in the sale of Basic Slag, and therefore purports to be merely an advertisement of the manure. Ordinarily we should not notice such a publication; but the fairness of the statements made in the text, and the sound advice which it also gives, has induced us to depart from custom.

The farmer must utilise every help he can obtain towards profitable farming. That Basic Slag has under certain conditions proved such a help is beyond dispute. But even the author of this work does not claim that it is the one and only phosphatic manure which should be applied. He recognises that "in some soils the phosphoric acid of Basic Slag gives better results than that of superphosphate, whereas, in other soils, superphosphate gives the best return."

Moreover, it is pointed out that the application of phosphoric acid alone can never be certain to yield the fullest returns, "for all our cultivated plants need, for their full development, not only phosphoric acid, but also nitrogen, potash, and lime." How and when to apply it, and the uses and effects of Basic Slag in manuring various crops, are fully described; and naturally some striking illustrations of its utility have been selected which every farmer can scarcely hope to equal. In fact, the author realises that much must depend on the land and "the quantities of fertilising ingredients which any particular soil can of itself supply to the crops."

"Each farmer should endeavour to obtain this knowledge in regard to the particular land he is farming;" and the author suggests that this should be done by experiments, and advises how to carry these out. At the end of his remarks upon this subject, we find some advice which cannot be too often enforced upon those who would make such experiments. "The

principal condition to be regarded in order that the experiment may give an exact result is, that the portion of the field selected for the experimental plots must be as level and otherwise as uniform as possible. It should rest upon one geological formation, and possess throughout its entire area the same degree of moisture; and from its history it should be known to have been evenly treated in the manuring, cultivation, and croppings of recent years. Also the experimental plots must be so far distant from trees, buildings, or hills, that they are not overshadowed by them, and that one part of the plots is not more exposed than another."

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6.—*Lawns and Pastures*. By MARTIN J. SUTTON. London: Simpkin, Marshall and Co.

THERE are few things of which an Englishman is more proud than the possession of a good lawn. It has an air of antiquity, is evidence of care and perseverance, and can only be obtained by constant attention. The desire to possess a good lawn, if it only be some 30 feet square, is ever present in the heart of every suburban dweller, yet partly from want of knowledge, partly from want of time, and largely from the weeds which persistently will crop up every year, few attain their heart's desire. The game of tennis, the increased interest now being taken in bowls, and the evergreen excitement of cricket, all promote the demand for good lawns. How to make these, how to keep them in order, and how to keep down or destroy weeds and moss, will be found briefly and well described in the first of these two books. "Permanent and Temporary Pastures," which is the full title of the two remaining works, are new editions of well-known books which have been previously noticed in this 'Journal'; and the mere fact of their having such a continuous sale is the best evidence, not only of their practical utility, but also of the growing interest in the cultivation of pastures which is exhibited by farmers. If it is generally true that whatever is worth doing is worth doing well, it is especially true in all branches of farming, and in none perhaps more so than in the care of permanent pastures. The marked difference in the value of various pastures, whether for grazing or milk production, is well known. It does not seem to be so well known that, by care and skilful management, an inferior pasture may be materially improved if only one knows how to set about it. And this is the information which these books supply: hence, doubtless, their well-deserved popularity.

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7.—*The Culture of Vegetables and Flowers.* By MESSRS. SUTTON AND SONS. London: Simpkin, Marshall, and Co. 5s.

MANY years ago we can well remember how every amateur gardener of any pretension relied on his "Abercrombie" as a safe and certain guide to successful gardening. We have one of these books now beside us, with all the marginal notes and little personal data made by its owner, whom we can well remember as an ardent gardener. The Abercrombie of to-day is the book we would now draw attention to. It seems to us to have all the advantages of the friend of our ancestors, and the additional advantage of being up to date.

A work on gardening must of necessity be a work of reference, and the first thing requisite in a work of reference is facility to discover the information required. No method of doing this has ever surpassed the alphabetic arrangement of an ordinary dictionary or encyclopædia, and the authors have realised this fact, dividing, however, for convenience, vegetables from flowers. The next desideratum is a good index, and this the book also possesses. Lastly, the gardener is always met with two main difficulties—not only does he require to know what to do, but also when to do it.

It is but natural that all the practical difficulties met with by gardeners should, times without number, have been brought home to the notice of the authors. Yet such men are often those who, having from long experience overcome the difficulties of the amateur, have forgotten what these were, and so they write over the heads of, and fail to be of help to, those of little experience. Nothing in this work has so struck us as its freedom from this fault.

As already intimated, the work treats of vegetables and flowers separately, while each of these sections is subdivided into what to do and when to do it, the first being taken alphabetically, according to the names of the plants, the second showing for each month the work which has to be accomplished. And here again the alphabetical order is retained, so that in a moment one can discover whether in the month of March, for example, asparagus, cauliflower or lettuce require attention, and, if so, what should be done.

In the culture of flowers a distinction is made between those obtained from seeds and of flowering bulbs, a separate chapter being devoted to each, but in the monthly treatment the two are wisely combined. Every gardener sooner or later has the misfortune of seeing some portion of his handiwork destroyed by insect pests or fungus growths of which he knows

or can discover little, and is often at a loss to know how to contend against. Information on these subjects is really essential to successful gardening, and three chapters, each of which is well illustrated, have been devoted thereto.

Such is a brief description of the contents of this book. The information which it gives is full, yet precise, so that the reader loses no time in wading through unnecessary verbiage to get at the gist of his subject. The only fault we have found with the book is that it would not go into our coat pocket, so that we might have it in the garden to refer to. On the other hand, so much information does the book contain that a pocket edition would necessarily have to be printed in much smaller type, and this, perhaps, would diminish its value to many readers. To every gardener, amateur or not, we can heartily recommend this thoroughly practical guide.

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# Bath and West and Southern Counties Society.

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## CROYDON MEETING, 1901.

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### JUDGES.

#### HORSES.

**Agricultural.**—Captain H. HEATON, Worsley, Manchester.

**Hunters and Army Remounts.**—W. H. DUNN, M.F.H., Wallingtons, Hungerford.

**Hackneys and Ponies.**—R. G. HEATON, The Ferry, Chatteris, Cambs.

**Harness Horses.**—JAS. HORNSBY, Laxton Park, Stamford; EVAN JONES, Manoravon, Llandilo.

**Jumping.**—J. F. FOWLER, Norton Malreward, Bristol; E. A. HARDWICK, Kewstoke, Weston-super-Mare.

#### CATTLE.

**Devon.**—W. LEVERTON, Woolleigh Barton, Beaford, North Devon; R. COOK, Chevithorne Barton, Tiverton, Devon.

**Shorthorn.**—H. GORRINGE, Kingston-by-Sea, Brighton; T. H. HUTCHINSON, Manor House, Catterick.

**Hereford.**—J. H. YEOMANS, Stretton House, Hereford.

**Sussex.**—R. HAMSHAR, Twineham, Hayward's Heath, Sussex.

**Red Polled.**—J. S. NUNN, Little Welnetham Hall, Bury St. Edmunds.

**Aberdeen-Angus.**—C. STEPHENSON, Sandysford Villa, Newcastle-on-Tyne.

**Jersey.**—W. P. ARKWRIGHT, Sutton Scarsdale, Chesterfield; R. CARR, Tring Park, Herts.

**Guernsey.**—G. T. BARHAM, Sudbury Park, Wembley.

**Kerry and Dexter.**—A. DEVERELL, Attington House, Tetsworth, Oxon.

#### SHEEP.

**Cotswold.**—J. J. GODWIN, Troy, Somerton, Banbury.

**Devon Long-wooled.**—W. STEVENS, Budlake, Broadclyst, Exeter.

**Kentish or Romney Marsh.**—H. M. COBB, Higham, Rochester.

**Southdown.**—W. MASSIE, Estate Office, Shillinglee Park, Petworth.

**Hampshire Down.**—CARY COLES, Winterbourne Stoke, Sallsbury.

**Shropshire.**—J. BOWEN-JONES, Beckbury, Shrewsbury.

**Oxford Down.**—J. BRYAN, Southleigh, Witney.

**Somerset and Dorset Horned.**—J. CHICK, Compton Valence, Dorchester.

## PIGS.

**Berkshire.**—H. HUMFREY, Shippon, Abingdon.

**Large Black.**—G. P. WATKINS, Culpho Hall, near Ipswich.

**Large, Middle, and Small White or Black, and Tamworth.**—  
H. SMITH, The Grove, Cropwell Butler, Nottingham.

## POULTRY.

W. B. TEGETMEIER, 16, Alexandra Grove, North Finchley; P. PERCIVAL,  
Somerset Court, Brent Knoll, Somerset.

## PRODUCE.

**Cider.**—T. RICHARDS, Huxham, East Pennard, Shepton Mallett.

**Cheese.**—E. HILL, The Towers, Evercreech, Somerset.

**Butter and Cream.**—Miss JENKINS, Instructress, County Council Dairy  
School, Stafford.

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## BUTTER-MAKING, SHOEING, AND MILKING.

## BUTTER-MAKING.

Professor CARROLL, Royal Albert Farm, Glasnevin, Dublin; W. J. GRANT,  
Pentonville, Newport, Monmouth.

## SHOEING.

F. W. WRAGG, F.R.C.V.S., 17, Church Lane, Whitechapel, London.

## MILKING.

W. PURSOTT, Cunynghame Hill, St. Albans.

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## PRIZE AWARDS, 1901.

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\* \* An animal designated in this list as the "reserve number" is entitled, *conditionally*, to succeed to any prize that may become vacant in its class by reason of the animal placed above it by the Judges failing afterwards to qualify.

† Animals, where not otherwise stated, may be considered to have been bred by the Exhibitor.

ABBREVIATIONS EXPLAINED:—S., sire; d., dam; s. of d., sire of dam; y., year; m., month; w., week; d., day; R., Reserve; V. H. C., Very Highly Commended; H. C., Highly Commended; C., Commended.

All ages calculated to May 30, 1901.

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### HORSES.

#### FOR AGRICULTURAL PURPOSES.—SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book.)

##### CLASS 1.—*Shire Stallion, foaled before 1899.* [5 entries.]

I. (£20.)—LORD ROTHSCHILD, Tring Park, Tring, Herts, brown, **Anchorite** (16,488), foaled 1896, bred by His Majesty King Edward VII., Sandringham; s., Harold (3703); d., Dunsmore Achievement (9899); s. of d., Mainstay.

II. (£10.)—LORD HOTHFIELD, Hothfield Place, Ashford, Kent, black, **Xerxes** (17,726), foaled May 6, 1897; s., Rubicon (14,258); d., Makeshift (12,883); s. of d., Hitchin Conqueror (4458).

R. & H. C.—M. MICHAELIS, Tandridge Court, Oxted, Surrey, bay, **Fole Harold** (18,018), foaled 1898, bred by J. Bailey, Fole Bank, Tean, Stoke-on-Trent; s., Limescrofts Harold (15,203); d., Lady Carlos (15,054); s. of d., Don Carlos (2416).

H. C.—W. GREENWELL, Marden Park, Woldingham, bay, **Markeaton Le Bon** (15,224), foaled 1891, bred by F. W. Ruston, Chatteris, Cambridge; s., Norden Charming (6214); d., Norden Gem; s. of d., Chatteris Le Bon (3023).

##### CLASS 2.—*Shire Stallion, foaled in 1899.* [14 entries.]

I. (£20.)—J. P. CROSS, Catthorpe Towers, Rugby, bay, **Lockinge Forest King**, foaled 1899, bred by Lord Wantage, Lockinge, Wantage; s., Lockinge Manners (16,780); d., The Forest Queen (4470); s. of d., Royal Albert.

II. (£10.)—C. S. MARSH, Little Offley, Hitchin, brown, **Desford Stylish Chief** (18,678), foaled March, 1899, bred by W. and J. Thompson, Desford, Leicester; s., Desford Vulcan Chief (16,110); d., Stylish Beauty (28,552); s. of d., Stylish Tom (14,885).

iv *Prizes awarded to Horses for Agricultural Purposes.*

**III. (£5.)**—W. GREENWELL, Marden Park, Woldingham, brown, **Marden Homer** (18,906), foaled April 9, 1899; s., Homer II. (16,186); d., Daisy Queen (4608); s. of d., Ely Harold (11,367).

**R. & H. C.**—M. MICHAELIS, Tandridge Court, Oxted, Surrey, bay, **Victor of Waresley** (19,212), foaled 1899, bred by W. O. H. Duncombe, Waresley Park, Sandy; s., Waresley Triumph (16,453); d., Packington Brave Girl (13,117); s. of d., Measham Chief (6124).

**H. C.**—LORD HOTHFIELD, Hothfield Place, Ashford, Kent, bay, **Zodiac**, foaled April 22, 1899; s., Trustee (14,908); d., Vesta (22,638); s. of d., Insurgent (11,668):—and P. F. R. SAILLARD, Buchan Hill, Crawley, Sussex, bay, **Ivory** (vol. xxiii.), foaled 1899, bred by W. Chappell, Tuxford, Newark; s., Nyn King Charles (15,271); d., Daisy (23,409); s. of d., Carlton Grey (6973).

**CLASS 3.—Shire Colt, foaled in 1900. [6 entries.]**

**I. (£15.)**—LORD ROTHSCHILD, Tring Park, Tring, Herts, bay, **Merry Duke** (vol. xxiii.), foaled April 16, 1900; s., Duke of Worsley (13,002); d., Hendre Merry Lass (26,134); s. of d., Prince Harold (14,228).

**II. (£10.)**—G. OSBENTON, Mariners, Westerham, Kent, brown, **Eden Chief** (vol. xxiii.), foaled February 16, 1900; s., Southgate Hero (16,400); d., Kingston Birthday (18,420); s. of d., Donovan (9764).

**R. & H. C.**—A. RANSOM, Hitchin, Herts, bay, **Hitchin Beau**, foaled March 30, 1900; s., Ciceter Beau Harold (17,258); d., Hemsall Blossom (16,772); s. of d., What is Wanted (8587).

**CLASS 4.—Shire Mare and Foal, or in-Foal. [11 entries.]**

**I. (£20.)**—A. RANSOM, Hitchin, Herts, bay, **Duchess of Bridgwater** III (7946), foaled 1888, bred by Lord Ellesmere, Worsley Hall, Manchester; s., Shrewsbury (4681); d., Blackpool (2986); s. of d., Bar None (2388); with foal by Oldbarden Royal Harold (16,300).

**II. (£10.)**—W. GREENWELL, Marden Park, Woldingham, chestnut, **Embargo** (18,172), foaled 1893, bred by M. Woodburne, Kirklands, Ulverston, Lancs.; s., Bar None (2388); d., Blagdon Beauty (4893); s. of d., Bonny Lad (3478).

**III. (£5.)**—LORD ROTHSCHILD, Tring Park, Tring, Herts, red roan, **Hendre Duchess** (13,411), foaled 1890, bred by E. Laverton, Shottle Hall, Derby; s., Glendon II. (935); d., Pink (13,143); s. of d., Merry Lad (2626); with foal by Anchorite (16,488).

**R. & H. C.**—F. HARGREAVES, Merton Grange, Gamlingay, Sandy, black, **Princess Beryl** (29,761), foaled 1896, bred by Sir H. Ewart, Kelvedon, Essex; s., Prince Harold (14,228); d., Jewel (6519); s. of d., Electric (3069); with foal by Waresley Triumph.

**H. C.**—R. W. HUDSON, Danesfield, Great Marlow, bay, **Nyn Lively** (17,136), foaled 1891, bred by A. Ransom; s., Hitchin William the Conqueror (7399); d., Hitchin Lively II. (6472); s. of d., Allen's Sampson (4205); with foal by Danesfield Prince (17,914):—and T. JONES, Quarry Farm, Godstone, Surrey, bay, **Marden Fan** (29,354), foaled March 19, 1896, bred by W. Greenwell, Marden Park, Caterham Valley, Surrey; s., Nailstone Harold (15,254); d., Ballam Fan (16,045, vol. xv. p. 118); s. of d., Mohammed (6173); with foal by Homer II. (16,186).

**CLASS 5.—Shire Filly or Gelding, foaled in 1898. [3 entries.]**

**I. (£10.)**—LORD ROTHSCHILD, Tring Park, Tring, Herts, red roan **Dorothy Drew** (28,374), foaled July 13, 1898; s., Prince Harold (14,228); d., Hendre Duchess (13,411); s. of d., Glendon II. (935).

**II. (£5.)**—W. GREENWELL, Marden Park, Woldingham, black, **Dunsmore June Rose** (28,420), foaled 1898, bred by P. A. Muntz, Dunsmore, Rugby; s., Harold (3703); d., Dunsmore Fleur de Lis (9862); s. of d., Dunsmore Willington Boy (13,021).

**R. & H. C.**—G. OSENTON, Westerham, chestnut, **Eden-Pansy** (28,452), foaled 1898; s., Witness (15,934); d., Fences Brisk (4897); s. of d., Wonder of the West (2371).

**CLASS 6.—Shire Filly or Gelding, foaled in 1899. [7 entries.]**

**I. (£10.)**—R. W. HUDSON, Danesfield, Great Marlow, bay filly, **Danesfield Heroine** (31,595), foaled 1899; s., Blythwood Conqueror (14,997); d., Saxon Heroine (22,416); s. of d., Tudor Harold (14,380).

**II. (£5.)**—M. MICHAELIS, Tandridge Court, Oxted, Surrey, chestnut filly, **Kathleen** (32,694), foaled 1899, bred by Sir J. Blundell Maple, Bart., M.P., Childwick, St. Alban's; s., Harold (3703); d., Wykeham Mabel (19,151); s. of d., English Oak (2771).

**R. & H. C.**—G. OSENTON, Mainers, Westerham, Kent, dark grey filly, **Eden Buttercup** (31,912), foaled April 15, 1899; s., Witness (15,934); d., Pratt's Heliotrope (22,308); s. of d., Bury Victor Chief (11,105).

**CLASS 7.—Shire Filly or Gelding, foaled in 1900. [13 entries.]**

**I. (£10.)**—LORD ROTHSCHILD, Tring Park, Tring, Herts, bay filly, **Birdsall Stately**, foaled 1900, bred by Lord Middleton, Birdsall House, York; s., Menestrel (14,180); d., Star (24,819); s. of d., Sturton Emperor (12,487).

**II. (£5.)**—LORD LLANGATTOCK, The Hendre, Monmouth, bay filly, **Hendre Birthright**, foaled 1900; s., Prince Harold (14,228); d., Bertha (16,103); s. of d., Albert Edward (5467).

**III. (£3.)**—J. P. CROSS, Catthorpe Towers, Rugby, brown, **Primeval**, foaled 1900, bred by J. P. TOONE, High Cross, Rugby; s., Coleshill Carbon (12,893); d., Primula (26,671); s. of d., Catthorpe Ganges (12,902).

**R. & H. C.**—The MARQUIS OF WINCHESTER, Ampthorpe, Andover, bay filly, **Lady Love** (vol. xxiii.), foaled 1900, bred by P. A. Muntz, M.P., Dunsmore, Rugby; s., Dunsmore Combination (17,314); d., Moons Bonny (22,191); s. of d., Regent II. (6316).

**H. C.**—A. R. FIRKINS, Paunton Court, Bishop Froome, Worcester, roan filly, **Paunton Rosebud**, foaled May 29, 1900, bred by M. Jones, Delbury, Craven Arms; s., Moors Thumper (15,241); d., Delbury Rose (25,794); s. of d., Blythwood Amazement (14,996):—and H. F. and E. LOCKE KING, Okehurst, Billingshurst, black filly, **Judgment of Okehurst**, foaled January 2, 1900; s., Hermit II. (9563); d., Queen Adelais (15,467); s. of d., Topsman V.

*Given by the Shire Horse Society, a Gold Medal, value £10, for Best Mare or Filly in Classes 4, 5, 6 or 7, under Conditions 46, stated in Prize Schedule.*

*The Shire Horse Society also awarded the Breeder of the Winner of the Gold Medal a prize of £5, provided such Breeder was a Member of the Shire Horse Society, and the dam a Mare Registered in the Stud Book.*

**I.**—LORD ROTHSCHILD, Tring Park, Tring, Herts, red roan, **Dorothy Drew** (28,374), foaled July 13, 1898; s., Prince Harold (14,228); d., Hendre Duchess (13,411); s. of d., Glendon II. (935).

**R.**—LORD ROTHSCHILD, bay filly, **Birdsall Stately**, foaled 1900, bred by Lord Middleton, Birdsall House, York; s., Menestrel (14,180); d., Star (24,819); s. of d., Sturton Emperor (12,487).

### ANY OTHER AGRICULTURAL BREED.

#### CLASS 8.—*Mare and Foal, or in-Foal.* [1 entry.]

**I. (£10.)**—H. P. TAUNTON, Redlynch, Salisbury, black, **Redlynch Pansy**, foaled 1898, bred by T. Bretberton, Preston; s., Stroxtan Tom; with foal by Redlynch Lord Harold.

#### CLASS 9.—*Filly or Gelding, foaled in 1898.* [4 entries.]

**I. (£7.)**—H. P. TAUNTON, Redlynch, Salisbury, black, **Redlynch Pansy**, foaled 1898, bred by T. Bretberton, Preston; s., Stroxtan Tom; with foal by Redlynch Lord Harold.

**II. (£5.)**—G. H. MOREY, Bridge Farm, Britford, Salisbury, Wilts, dark bay, two white feet, **Colonel**, foaled about May 25, 1898.

**R. & H. C.**—J. BROWN, Marden Farm, near Hertford, bay Clydesdale filly, **London Aggie**, foaled May, 1898; s., London Lad (10,081); d., London Diamond (C.S.B., vol. xxiii.); s. of d., Royal Reward (10,003).

#### CLASS 10.—*Filly or Gelding, foaled in 1899.* [3 entries.]

**I. (£7.)**—J. BROWN, Marden Farm, near Hertford, bay Clydesdale gelding, **London Bob**, foaled April, 1899; s., London Lad (10,081); d., London Diamond (C.S.B., vol. xxiii.); s. of d., Royal Reward (10,003).

**II. (£5.)**—G. H. MOREY, Bridge Farm, Britford, Salisbury, Wilts, bay filly, **Bess**, foaled May 28, 1899.

**R. & H. C.**—G. H. MOREY, dark bay gelding, **Bob**, foaled May 12, 1899.

### HUNTERS.

#### CLASS 11.—*Hunter Mare and Foal, or in-Foal.* [7 entries.]

**I. (£20.)**—W. M. HARRISON, Burtonfields, Stamford Bridge, York, brown, **Patti**, foaled 1890, bred by T. Bradley, Uffington, Stamford, Lincolnshire; s., Pax; d., Sally; with foal by Ruddigore.

**II. (£10)** and **Special.\***—J. FORD, River Yealm Hotel, Newton Ferrers, Plymouth, grey, **Tit-Bit**, bred by G. Chapman, Gampound Road, Cornwall; s., **Uncle Sam**.

**R.**—Rev. C. BOLDEN, Preston Bissett, Buckingham, chestnut, **Olive Cromwell** (No. 423, vol. iii.), foaled 1887, bred by J. Martin, Wainfleet, Lincolnshire; s., **Fabius**; d., **Lady Cromwell** (No. 203, vol. ii.); s. of d., **Cromwell**.

**R. for Special.\***—S. LEE SMITH, Larkfield, near Maidstone, black, **Sarah**, foaled April 17, 1894; s., **Sir Isaac**; d., **Highland Helen**; s. of d., **Highland Chief**; with foal by **King's Beadman**.

**CLASS 12.—Hunter Mare or Gelding, foaled in 1897. [8 entries.]**

**I. (£20).**—J. H. STOKES, Nether House, Great Bowden, Market Harborough, chestnut gelding, foaled 1897.

**II. (£10).**—MASON and BROWN, Ravenscroft, Hendon, N.W., bay gelding, **Twinkle**, foaled 1897.

**III. (£5).**—H. B. CORY, Druidstone, Castleton, Cardiff, chestnut, **St. Clears**, foaled 1897, bred by the late Lord Kensington, **St. Bride's**, Little Haven, South Wales; s., **Glory Smitten**; d., **Free Trade**.

**R.**—H. B. CORY, brown, **St. Fagans**, foaled 1897, bred by the late Lord Kensington; s., **Glory Smitten**.

**CLASS 13.—Hunter Filly or Gelding, foaled in 1898. [5 entries.]**

**I. (£15).**—H. B. CORY, Druidstone, Castleton, Cardiff, chestnut, **St. Mellons**, foaled 1898, bred by R. Duggleby, Sherburn, Yorks; s., **Dermont**; d., **Conductor**.

**II. (£10).**—J. WALLIS, The Banks, Beddington, chestnut gelding, **Patent Safety**, foaled 1898, bred by M. D. Rucker, late Woodlands Park, Leatherhead; s., **Heston**.

**R. and Special.†**—C. KELWAY-BAMBER, Priestlands, Horley, Surrey, chestnut filly, **Homely Lass** (1907, H.I.S.B.), foaled May 1, 1898; s., **Homely**; d., **Sweetheart** (1641, H.I.S.B.); s. of d., **Napsbury**.

**CLASS 14.—Hunter Filly or Gelding, foaled in 1899. [7 entries.]**

**I. (£10)** and **Special.‡**—S. St. Barbe Emmott, Apsley Paddox, Oxford, chestnut roan gelding, **Rainbow**, foaled April 11, 1899; s., **Just in Time**; d., **Lady Jane** (No. 1937, H.I.S.); s. of d., **Irish Bred**.

**II. (£7), and R. for Special.‡**—W. V. ANDREW, Oldbury, near Southend—

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\* Given by the Hunters' Improvement Society, a Gold Medal, or £5 and a Bronze Medal, for the Best Hunter Brood Mare in Class 11, in-Foal to, or with Foal at-foot by, a Thoroughbred Horse or registered Hunter Sire, not having previously won the Hunters' Improvement Society's Gold Medal or Premium as a Brood Mare, under Conditions 47, stated in Prize Schedule.

† Given by the Hunters' Improvement Society, a Silver Medal, for the Best Hunter Filly by a Thoroughbred Horse or Registered Hunter Sire in Classes 13, 14, or 15, not exceeding three years old, (foaled in 1898, 1899, or 1900), under Conditions 48, stated in Prize Schedule.

‡ A Silver Medal, for the Best Hunter Mare or Gelding of any age, bred by a Thoroughbred or Registered Hunter Sire out of a Registered Mare or a Mare qualified for Registration in vol. ix., subject to Conditions 49, stated in Prize Schedule.

viii *Prizes awarded to Army Remounts and Hackneys.*

on-Sea, brown gelding, **Royal Bandon**, foaled May 24, 1899, bred by — Gash, Bandon, Cork, Ireland; s., Royal Meath.

**III. (£3.)**—J. L. NICKISSON, Warfield, Bracknell, Berks. chestnut gelding, **March Wind**, foaled March 4, 1899, bred by F. W. Barling, Ross; s., Whisperer; d., Stella; s. of d., Herbertstown.

**R. & C.**—E. HOYLE, Moorlands, Bacup, chestnut gelding, **Rosebery**, foaled May 2, 1899, bred by J. Kerr, Deep Grove, Lythe, Whitby; s., Khartoum (vol. xvii. 340); d., Wild Rose (vol. viii. 150); s. of d., Bass Rock (vol. x. 204 and 453).

**CLASS 15.—Hunter Filly, Colt or Gelding, foaled in 1900.**

[7 entries.]

**I. (£10.)**—J. HAYMAN-JOYCE, Chitcombe, Brede, Sussex, chestnut colt, **Boy Blue**, foaled April 23, 1900, bred by D. Reeve, Matfield, Kent; s., Blue Blood; d., Beatrice; s. of d., Outfit.

**II. (£7) and R. for Special.\***—Mrs. C. M. PERKINS, Oak Dene, Holmwood, Surrey, bay filly, **Lady Radnor**, foaled April 23, 1900, bred by Miss A. C. Perkins, Oak Dene, Holmwood, Surrey; s., Chibiabos; d., Lady Hastings (1934).

**R.**—C. LEVESON-GOWER, Titsey Place, Limpsfield, Surrey, bay filly, **Lady Bobs**, foaled April 10, 1900; s., Chibiabos; d., Miss Murphy; s. of d., The Lawyer.

**ARMY REMOUNTS.**

**CLASS 16.—Mare or Gelding, foaled in 1895, 1896 or 1897, 15-2 to 16 hands, not short docked (greys excluded), suitable for Artillery purposes, to be sold, if required, for £40.** [2 entries.]

**I. (£10.)**—V. VERVACKE, 105, London Road, Croydon, brown gelding, foaled 1895.

**CLASS 17.—Mare or Gelding, foaled in 1895, 1896, or 1897, 15-1½ to 15-3 hands, not short docked (greys excluded), suitable for Cavalry purposes, to be sold, if required, for £40.** [3 entries.]

**I. (£10.)**—V. VERVACKE, 105, London Road, Croydon, brown gelding.

**HACKNEYS.**

(Registered or eligible for registration in the Hackney Horse Society's Stud Book.)

**CLASS 18.—Hackney Mare and Foal, or in-Foal.** [4 entries.]

**I. (£15) and Special.†**—H. LIVESEY, Rotherfield, Sussex, chestnut mare and foal, **Surprise** (3299), foaled 1899, bred by W. Waterhouse, Stour-

\* Given by the Hunters' Improvement Society, a Silver Medal, for the Best Hunter Filly by a Thoroughbred Horse or Registered Hunter Sire in Classes 13, 14, or 15, not exceeding three years old (foaled in 1898, 1899, or 1900), under Conditions 48, stated in Prize Schedule.

† Given by the Hackney Horse Society, a Gold Medal (value £10), for the Best Mare or Filly exhibited in Classes 18 to 24, under Conditions 50, stated in Prize Schedule.

borough Castle, Edenbridge, Kent; s., Ritualist (1542); d., Brunette (49); s. of d., Lord Derby II. (417); with foal by McKinley (6475).

**II. (£10).**—R. T. THORNTON, Middleton Hall, Brentwood, Essex, chestnut mare, **Clairvoyant**, foaled 1896, bred by Earl Egerton of Tatton, Quidenham Hall, Norfolk; s., Ganymede; d., Clairette; s. of d., Caractacus, with foal by Garton Duke of Connaught.

**R.**—E. J. ALLEN, Stanhill, Wilmington, Kent, black mare, **Lady Wilmington** (9190), foaled 1894; s. Grand Fashion II. (3024); d. Una (3329); s. of d. Canvasser (114).

**CLASS 19.—Hackney Mare or Gelding, foaled before 1897.**

[4 entries.]

**I. (£10).**—F. J. BATCHELOR, Hopwood Stud Farm, Alvechurch, Worcestershire, chestnut gelding, **Hopwood Champion**, foaled April 7, bred by W. H. Taylor, Haywood, Crockey Hill, York; s., Garton Duke of Connaught (3009); d., My Lady; s. of d., Prince Alfred (1325).

**II. (£5).**—Mrs. H. F. BATT, 131, Elgin Avenue, W., chestnut gelding, **Heretic**, foaled 1895, bred by J. Morton, Stow, Downham Market, Norfolk; s., Ganymede (2076); d., Hearty (2807); s. of d., Cadet (1251).

**R.**—Mrs. F. E. COLMAN, Nork Park, Ensom Downs, bay gelding, **Royal Sensation**, foaled 1896, bred by the late F. E. Colman, Nork Park, Epsom Downs; s., Danegelt; d., Moonlight; s. of d., Old Times.

**CLASS 20.—Hackney Mare or Gelding, foaled in 1897 or 1898.**

[3 entries.]

**I. (£10).**—R. T. THORNTON, Middleton Hall, Brentwood, Essex, chestnut mare, **Tricksey**, foaled 1898, bred by J. W. Crossley, Rrian Royd, Greetland, Halifax; s., Garton Duke of Connaught; d., Althorp Queen; s. of d., Confidence.

**II. (£5).**—T. D. JOHN, Chaldean's Stud Farm, St. Fagans, near Cardiff, chestnut, **Druidstone Kathleen**, foaled 1898; s., Conquest II. (5560); d., Kathleen (162); s. of d., Star of the East (798).

**CLASS 21.—Hackney Filly or Gelding, foaled in 1899. [2 entries.]**

**I. (£10) and R. for Special.\***—R. JAY, Hollybush Stud Farm, Southgate, chestnut filly, **Knowle Halma** (H.S.B., 13,633), foaled 1899, bred by R. Simpson, Ashfield, Market Weighton; s., His Majesty (2513); d., Lady Buckrose (2875); s. of d., Pioneer (1038).

**R.**—W. S. FORSTER, Rumwood Stud, Maidstone, Kent, bay filly, **Lady Bobs**, foaled March 3, 1899, bred by D'A. W. Reeve, The Friars, Malfield, Paddock Wood; s., Conquest II. (5560); d., Nettie (5931); s. of d., Vigorous (1215).

**CLASS 22.—Hackney Filly, Colt or Gelding, foaled in 1900.**

[6 entries.]

**I. (£10).**—F. J. BATCHELOR, Hopwood Stud Farm, Alvechurch, Worcestershire, chestnut filly, **May Hopwood** (vol. xix.), foaled 1900;

\* Given by the Hackney Horse Society, a Gold Medal (value £10), for the Best Mare or Filly exhibited in Classes 18 to 24, under Conditions 50, stated in Prize Schedule.

s., Garton Duke of Connaught (3007); d., May Queen (9286); s. of d., Danegelt (174).

**II. (£5).**—W. S. FORSTER, Rumwood, Langley, Maidstone, black chestnut colt, foaled March 30, 1900, bred by W. Lloyd, Heaslands, Haywards Heath; s., Conquest II. (5560); d., Lady Bloom (11,950); s. of d., Bagthorpe Swell (5880).

**III. (£3).**—W. R. LYSAGHT, Dannel Hill, Chepstow, chestnut colt, **Don Quixote**, foaled May 4, 1900; s., Garton Duke of Connaught (3009); d., Lady Kate (9112); s. of d., Evolution (2058).

**R.**—R. T. THORNTON, Middleton Hall, Brentwood, Essex, chestnut filly, **Middleton Fancy**, foaled 1900, bred by J. Barker, The Grange, Bishops Stortford; s., Wyngelt; d., Isoline; s. of d., Anconcus II.

## PONIES.

**CLASS 23.**—*Pony Mare or Gelding, four years old or over, exceeding 13 and not exceeding 14.2 hands.* [7 entries.]

**I. (£10).**—E. BAXTER, Hutton Stud, Brentwood, Essex, bay mare, **Miss Howard** (12,134), foaled 1893, bred by W. Rook, Bielby, Everingham, Yorks; s., Sensation VI. (3265); d., Bielby Princess (5034); s. of d., King Charley (392).

**II. (£5).**—E. BAXTER, bay mare, **Musk** (8323), foaled 1893, bred by E. Farnaby, Beverley, Yorks; s., Caxton (2398); d., Matron (1697); s. of d., Lord Derby II. (vol. ix. 417).

**III. (£3).**—R. T. THORNTON, Middleton Hall, Brentwood, Essex, bay, **Dandy**, foaled 1893, bred by C. Wilson; s., Pegasus; s. of d., Little Wonder II.

**R.**—J. STEVENS, The Elms, South Norwood, S.E., bay mare, **Norwood Queen**, foaled May, 1895.

**CLASS 24.**—*Pony Mare or Gelding, four years old or over, not exceeding 13 hands.* [4 entries.]

**I. (£10).**—E. BAXTER, Hutton Stud, Brentwood, Essex, chestnut mare, **Intake Wonder** (vol. xix.), foaled 1896, bred by J. W. Simpson, Tuxford, Newark; s., Danegelt's Wonder II. (vol. xviii.); d., Intake Wonderess (12,756); s. of d., Little Wonder II. (1610, vol. xvii.).

**II. (£5).**—W. SLARK, Glenisla, Downs Road, Epsom, gelding, **Tommy**, foaled 1896.

**R.**—T. R. WRIGHT, Elduelie, Duppas Hill, Croydon, grey gelding, **Boba**, foaled March 1, 1894, bred by — Bellham, near Downham Market, Norfolk.

## HARNESS.

**CLASS 25.**—*Mare or Gelding, 15 hands or over. Driven in harness on the second day of Show.* [6 entries.]

**I. (£15).**—Miss E. K. CUNLIFFE, Tyrrels Wood, Leatherhead, chestnut gelding, **Von Harbinger**.

**II. (£5).**—E. BAXTER, Hutton Stud, Brentwood, Essex, bay, **Lady Nell**

(9155), foaled 1894, bred by H. Hind, Highfield, Wyke, Bradford; s., Danger (4216); d., Nellie Bly (4477); s. of d., Robin Adair (1545).

**III. (£2).**—W. S. CUNARD, Hawthorn Hill, Bracknell, grey gelding, **Silver King**; s., His Majesty; s. of d., King of the Forest.

**R.**—F. J. BATCHELOR, Hopwood Stud Farm, Alvechurch, Worcestershire, chestnut gelding, **Hopwood Champion**, foaled April 7th, bred by W. H. Taylor, Haywood Crockey Hill, York; s., Garton Duke of Connaught (3009); d., My Lady; s. of d., Prince Alfred (1325).

**H. C.**—Miss E. S. ROSS, Beechfield, Sale, Cheshire, gelding, **Rowton Blackthorn**, bred by J. W. Macfie, Rowton Hall, Chester; s., Grand Fashion 2nd (3024); d., Blackie (1449); s. of d., King Cole (2130).

**C.**—Mrs. H. F. BATT, 131, Elgin Avenue, W., chestnut gelding, **Heretic**, foaled 1895, bred by J. Morton, Stow, Downham Market, Norfolk; s., Gany-mede (2076); d., Hearty (2807); s. of d., Cadet (1251).

**CLASS 26.—Pair of Carriage Horses (Mares or Geldings). Driven in double harness on the second day of Show. [9 entries.]**

**I. (£15).**—Miss E. K. CUNLIFFE, Tyrrels Wood, Leatherhead, chestnut gelding, **Silverleaf**, and her chestnut gelding, **Von Harbinger**.

**II. (£5).**—F. J. BATCHELOR, Hopwood Stud Farm, Alvechurch, Worcestershire, chestnut gelding, **Hopwood Champion**, foaled April 7th, bred by W. H. Taylor, Haywood, Crockey Hill, York; s., Garton Duke of Connaught (3009); d., My Lady; s. of d., Prince Alfred (1325); and his chestnut mare, **Wild Agnes** (10,612), foaled May 11, 1895, bred by J. Robinson, Hedon, near Hull; s., Master of Ballantrae (4403); d., Edith (5255); s. of d., Topper (1350).

**III. (£2).**—E. BAXTER, Hutton Stud, Brentwood, Essex, bay mare. **Musk** (8323), foaled 1893, bred by E. Farnaby, Beverley, Yorks; s., Caxton (2398); d., Matron (1697); s. of d., Lord Derby II. (vol. ix. 417); and bay mare **Miss Howard** (12,134), foaled 1893, bred by W. Rook, Bielby, Everingham, Yorks; s., Sensation VI. (3265); d., Bielby Princess (5034); s. of d., King Charley (392).

**R.**—Miss E. S. ROSS, Beechfield, Sale, Cheshire, black brown gelding, **Rowton Vinca** (5779), bred by J. W. Macfie, Rowton Hall, Chester; s., Grand Fashion 2nd (3024); d., Lady Verbena (302); and her gelding, **Rowton Blackthorn**, bred by J. W. Macfie, Rowton Hall, Chester; s., Grand Fashion 2nd (3024); d., Blackie (1449); s. of d., King Cole (2130).

**H. C.**—Mrs. H. F. BATT, 131, Elgin Avenue, W., bay mare and gelding **Lady Wiles** and **Sir George**, foaled 1894 and 1896; Lady Wiles, bred by J. Drewery, Little Hatfield, Skerlaugh, Hull; s., Saxon (2674); d., Miss Wiles (4420); s. of d., Lord Derby II. (417); Sir George, bred by R. E. Ingham, Hullenedge, Elland, Yorks; s., Bessemere (4138); d., Village Mirth (4852); s. of d., Lord Derby II.

**CLASS 27.—Mare or Gelding, under 15 hands. Driven in harness on the third day of Show. [23 entries.]**

**I. (£15).**—J. Mitchell, J. P., Bryntirion, Hereford, bay gelding, **Norbury Lincoln**, bred by C. Fowler, Lincoln; s., Garton Duke of Connaught (3009); d., Maid Marion (751); s. of d., Lord Derby 2nd (417).

**II. (£5).**—F. J. BATCHELOR, Hopwood Stud Farm, Alvechurch, Worcestershire, chestnut mare, **Wild Agnes** (10,612), foaled May 11, 1895, bred by J. Robinson, Hedon, near Hull; s., Master of Ballantrae (4403); d., Edith (5255); s. of d., Topper (1350).

**III. (£2).**—E. BAXTER, Hutton Stud, Brentwood, E-sex, bay, **Hutton Mimosa** (13,578), foaled 1895, bred by W. B. Fryer, Browick Hall, Wymondham, Norfolk; s., Vigorous (1215); d., Gondola (5372); s. of d., Confidence (158).

**R.**—Mrs. R. B. LEEMING, 15, Kensington Gardien Terrace, Hyde Park, grey mare, **Snowdrop**, 7 y., bred by Frederick Hardcastle, Eastington, Brough, Yorks; s., His Majesty (2513); s. of d., Fireaway (249).

**H. C.**—Miss E. K. CUNLIFFE, Tyrrels Wood, Leatherhead, black mare, **Gavotte** (H.S.B., 9972), foaled 1894, bred by T. Mitchell, The Park, Eccleshill, Bradford; s., Lord Rattler (2566); d., Faithful; s. of d., Foston Fireaway (288).

**C.**—Mrs. H. F. BATT, 131, Elgin Avenue, W., bay mare and gelding, **Lady Wiles** and **Sir George**, foaled 1894 and 1896; Lady Wiles, bred by J. Drewery, Little Hatfield, Skerlaugh, Hull; s., Saxon (2674); d., Miss Wiles (4420); s. of d., Lord Derby II. (417); Sir George, bred by R. E. Ingham, Hullenedge, Elland, Yorks; s., Bessemere (4138); d., Village Mirth (4852); s. of d., Lord Derby II.

**CLASS 28.—Tandems (Mares or Geldings). Driven in harness on the third day of Show. [9 entries.]**

**I. (£15).**—E. BAXTER, Hutton Stud, Brentwood, Essex, bay mare, **Musk** (8323), foaled 1893, bred by E. Farnaby, Beverley, Yorks; s., Caxton (2398); d., Matron (1697); s. of d., Lord Derby II. (vol. ix. 417); and his bay mare **Miss Howard** (12,134), foaled 1893, bred by W. Rook, Bielby, Everingham, Yorks; s., Sensation VI. (3265); d., Bielby Princess (5034); s. of d., King Charley (392).

**II. (£5).**—F. J. BATCHELOR, Hopwood Stud Farm, Alvechurch, Worcestershire, chestnut gelding, **Hopwood Champion**, foaled April 7, bred by W. H. Taylor, Haywood Cockey Hill, York; s., Garton Duke of Connaught (3009); d., My Lady; s. of d., Prince Alfred (1325); and his chestnut mare, **Wild Agnes** (10,612), foaled May 11, 1895, bred by J. Robinson, Hedon, near Hull; s., Master of Ballantrae (4403); d., Edith (5255); s. of d., Topper (1350).

**III. (£2).**—Mrs. H. F. BATT, 131, Elgin Avenue, W., bay mare and gelding, **Lady Wiles** and **Sir George**, foaled 1894 and 1896; Lady Wiles, bred by J. Drewery, Little Hatfield, Skerlaugh, Hull; s., Saxon (2674); d., Miss Wiles (4420); s. of d., Lord Derby II. (417); Sir George, bred by R. E. Ingham, Hullenedge, Elland, Yorks; s., Bessemere (4138); d., Village Mirth (4852); s. of d., Lord Derby II.

**R.**—R. T. THORNTON, Middleton Hall, Brentwood, Essex, bay mares, **Ready Money** and **Middleton Bon Bon**, foaled 1895 and 1896; Ready Money, bred by R. Hornsey, South Care, Yorks; s., Eboracum; d., Primrose Dale; s. of d., Lord Beaconsfield IV.; Middleton Bon Bon, bred by W. T. Tomlinson, Wheldrake, Yorks; s., Chocolate Junior; s. of d., North Star.

**CLASS 29.—***Pair of Carriage Horses (Mares or Geldings). Driven in double harness on the fourth day of Show, open only to Residents within a radius of five miles of the Town Hall, Croydon.*  
[3 entries.]

**I. (£10.)**—T. R. WRIGHT, Elderslie, Duppas Hill, Croydon, chestnut geldings, **Swell and Telephone.**

**II. (£5.)**—V. VERVAEKE, 105, London Road, Croydon, bay and chestnut geldings.

**R.**—Mrs. VERVAEKE, gelding, **Bobby**, and mare, **Dolly.**

**CLASS 30.—***Best Tradesman's turn out (with one horse and two wheels), used solely and constantly for trade purposes, and to have been in Exhibitor's possession for at least two months prior to date of Show. Open only to Residents within a radius of five miles of the Town Hall, Croydon. Exhibited on the fifth day of Show.* [8 entries.]

**I. (£5.)**—J. and T. H. WALLIS, Wandle Dairies, Beddington.

**II. (£3.)**—A. E. HILL, 163, High Road, Streatham, S. W., liver chestnut mare, **Huntsman's Meteor**; s., Cartridge; d., Astronomy.

**III. (£2.)**—G. WALLIS, 12, London Road, Croydon.

**R.**—G. Wallis.

**CLASS 31.—***Trotting. Best Mare or Gelding for speed and action. Driven in harness on the fourth day of Show.* [11 entries.]

**I. (£10.)** L. W. WINANS, 5, Grand Avenue, Hove, Brighton, chestnut gelding, **Governor Roosevelt.**

**II. (£5.)**—W. WINANS, Surrenden Park, Pluckley, Kent, brown American, **Princell.**

**III. (£2.)**—W. WINANS, chestnut American, **Barney F.**

**R.**—W. G. ROSS, Grove House, Dulwich Common, S.E., chestnut gelding, **Little Wonder.**

**CLASS 32.—***Best Tradesman's turn-out (with one or two horses and four wheels), used solely and constantly for trade purposes, and to have been in the Exhibitor's possession for at least two months prior to the date of Show. Open only to Residents within a radius of five miles of the Town Hall, Croydon. Exhibited on the fifth day of Show.* [16 entries.]

**I. (£5.)**—G. C. PARSONS, 100, Whitehouse Road, Croydon, bays, **Mick** and **Nobby.**

**II. (£3.)**—P. STEWART, 12, Lahore Road, Croydon, brown mare, **Darling**, and brown gelding, **Traveller.**

**III. (£2.)**—ARCHER, SMITH, SONS AND Co., Gloucester Road, Croydon, black gelding, **Champion.**

**R.**—ARCHER, SMITH, SONS AND Co., bay geldings, **Dick** and **Prince.**

**H. C.**—G. C. PARSONS, brown, **Dick.**

**C.**—W. LILlico, Church Street, Croydon, red roan mare:— and G. C. PARSONS, bay, **Kitty.**

**CLASS 33.**—*A Gold Medal (value £5) was offered by the Hackney Horse Society, for the Best Mare or Gelding not less than 15-2 hands, exhibited in the Harness Classes in single harness, subject to Conditions 51, stated in Prize Schedule. Exhibited on the fifth day of Show. [3 entries.]*

[No COMPETITION.]

### **JUMPING.**

**CLASS 34.**—*Mare or Gelding, that shall jump in the best form on the second day of Show. [21 entries.]*

**I. (£10.)**—Mrs. BLOCKLEY, Moor Hall, Madeley, Staffs., brown gelding, **Omega**.

**II. (£5.)**—J. COLEMAN, The Farm, Church Street, Epsom.

**III. (£2.)**—A. N. SMITH, Danehurst, Nutfield, Surrey, chestnut, **Little Lady**.

**H. C.**—J. COLEMAN :—and C. W. JACKSON, 38, Spencer Park, Wandsworth Common, London, S.W., bay gelding, **Sirdar**.

**CLASS 35.**—*Mare or Gelding, under 15 hands, that shall jump in the best form on the second day of Show. [11 entries.]*

**I. (£10.)**—J. WHEELER, Shakespeare Farm, Studley, **Laddie**.

**II. (£5.)**—R. TUGWELL, Tetbury, brown mare, **Dainty**.

**III. (£2.)**—Miss K. GREENWELL, Marden Park, Woldingham, grey gelding, **Guinea Pig**.

**R.**—B. ROBINS, Lynsters, Rickmansworth, **Ladies Maid**; s., Royal Page; d., Lady Grey; s. of d., Tom Steele.

**CLASS 36.**—*Mare or Gelding, 15-2 hands or over, that shall jump in the best form on the third day of Show. [17 entries.]*

**I. (£10.)**—Mrs. BLOCKLEY, Moor Hall, Madeley, Staffs., brown gelding, **Omega**.

**II. (£5.)**—T. G. FOSTER, Brailsford, Derby, **Paddy**.

**III. (£2.)**—C. W. JACKSON, 38, Spencer Park, Wandsworth Common, London, S.W., bay gelding, **Sirdar**.

**CLASS 37.**—*Mare or Gelding, under 15-2 hands, that shall jump in the best form on the third day of Show. [15 entries.]*

**I. (£10.)**—A. N. SMITH, Danehurst, Nutfield, Surrey, chestnut, **Little Lady**.

**II. (£5.)**—Mrs. BLOCKLEY, Moor Hall, Madeley, Staffs., brown mare, **Diana**.

**III. (£2.)**—T. G. FOSTER, Brailsford, Derby, **Gipsy**.

**R.**—BUCKLAND, Great Chart.

**CLASS 38.**—*Mare or Gelding, under 15·2 hands, that shall jump in the best form on the fourth day of Show. The first prize winner in Class 37 could not compete in Class 38.* [15 entries.]

**I. (£10.)**—MRS. BLOCKLEY, Moor Hall, Madeley, Staffs., brown mare **Diana**.

**II. (£5.)**—T. G. FOSTER, Brailsford, Derby, **Gipsy**.

**III. (£2.)**—R. TUGWELL, Tetbury, brown mare, **Dainty**.

(The First Prize in Class 39 was given by the Croydon Local Committee.)

**CLASS 39.**—*Trooper Mare or Gelding, belonging to a Member of an English Yeomanry Corps. Ridden over hurdles by its owner in full uniform and accoutrements on the fourth day of Show.* [8 entries.]

**Equal II. (£2 10s.)**—G. E. HOARE, Hampshire Carabiniers Yeomanry, Underhills Farm, brown, **Pet**.

**Equal II. (£2 10s.)**—R. NIGHTINGALL, Lyndhurst, Epsom, bay, **Fanciful**.

**CLASS 40.**—*Mare or Gelding, 15 hands or over, that, having competed, had not won a prize in any Jumping Class at the Society's Croydon Show, that shall jump in the best form on the fifth day of Show.* [11 entries.]

**I. (£10.)**—J. COLEMAN, The Farm, Church Street, Epsom.

**II. (£5.)**—A. N. SMITH, Danehurst, Nutfield, Surrey, bay gelding, **Grasshopper**.

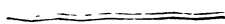
**III. (£2.)**—J. COLEMAN.

**R.**—J. FORD, River Yealm Hotel, Newton Ferrers, near Plymouth, bay mare, **Easter Morn**, foaled May 1, 1897, bred by G. Woou, St. Austell; s., Colemaird..

**CLASS 41.**—*Mare or Gelding, under 15 hands, that, having competed, had not won a prize in any Jumping Class at the Society's Croydon Show, that shall jump in the best form on the fifth day of Show.* [4 entries.]

**I. (£10.)**—A. N. SMITH, Danehurst, Nutfield, Surrey, mare, **Starlight**.

**II. (£5.)**—B. ROBINS, Lynsters, Rickmansworth, **Ladies Maid**; s., Royal Page; d., Lady Grey; s. of d., Tom Steele.



## CATTLE.

## DEVON.

CLASS 42.—*Devon Bull, calved in 1897 or 1898.* [3 entries.]

**I. (£10).**—J. C. WILLIAMS, Caerhays, St. Austell, **Dramatist** (4015), born July 5, 1898; s., Pretty Middling (2859); d., Ellen Terry 3rd (12,561); s. of d., Marmaduke (2280).

**II. (£5).**—A. BOWERMAN, Capton, Williton, Taunton, **Sir Walter**, born April 8, 1897; s., Lord Culverhay (3469); d., Apricot (13,743); s. of d., Palmerston (2474).

**R.**—Hon. E. W. B. PORTMAN, Hestercombe, Taunton, Somerset, **Hestercombe Ruby** (4045), born July 28, 1898; s., Royal Boy (3806); d., Ruth (4450); s. of d., Lord Noble (1785).

CLASS 43.—*Devon Bull, calved in 1899.* [5 entries.]

**I. (£15).**—J. C. WILLIAMS, Caerhays, St. Austell, **Mica** (4262), born February 8, 1899; s., Kimberley (3757); d., Mirabel 3rd (15,510); s. of d., Afterthought (3375).

**II. (£10).**—J. C. WILLIAMS, **Woodman**, born May 19, 1899; s., Woodcock (3831); d., Lady Queen 2nd (14,291); s. of d., Marmion (2642).

**III. (£5).**—A. BOWERMAN, Capton, Williton, Taunton, **Bean Planter**, born January 3, 1899; s., Harold 4th (3595); d., Modesty (14,974); s. of d., Pretty Middling 3rd (3173).

**R. & H. C.**—Col. A. F. WALTER, Bear Wood, Wokingham, Berks, **Bear Wood Rival**, born January 13, 1899, bred by J. Tapp, Bridgwater, Somerset; s., Lord Harwood (4059); d., Daisy; s. of d., Barnet (2708).

CLASS 44.—*Devon Bull, calved in 1900.* [4 entries.]

**I. (£12).**—A. BOWERMAN, Capton, Williton, Taunton, **Ringleader**, born January 1, 1900; s., Lord Culverhay (3469); d., Allspice (14,965); s. of d., Pretty Middling 3rd (3173).

**II. (£5).**—J. C. WILLIAMS, Caerhays, St. Austell, **Musa**, born January 27, 1900; s., Pretty Middling (2859); d., Mirabel 3rd (15,510); s. of d., Afterthought (3375).

**R.**—J. C. WILLIAMS, **Foxglove**, born February 13, 1900; s., Afterthought (3875); d., Fitful 2nd (14,286); s. of d., Cardsharper (3082).

CLASS 45.—*Devon Cow, in-Milk, calved before 1898.* [2 entries.]

**I. (£15).**—Hon. E. W. B. PORTMAN, Hestercombe, Taunton, **Tulip 10th of Pound** (15,961), born May 6, 1897, bred by A. C. Skiuner, Bishop's Lydeard, Taunton, Somerset; s., Harold 4th (3595); d., Tulip 9th of Pound (13,616); s. of d., Masterpiece (2837).

CLASS 46.—*Devon Heifer, in-Milk, calved in 1898.* [2 entries.]

**I. (£10).**—Hon. E. W. B. PORTMAN, Hestercombe, Taunton, Somerset, **Hestercombe Princess** (16,464), born March 12, 1898; s., Duke of Currypool (3096); d., Longhorns 5th (14,671); s. of d., Lordship (2820).

**R.—E. J. STANLEY, M.P.,** Quantock Lodge, Bridgwater, **Quantock Venus 16th** (16,564), born April 9, 1898; s., Goodwill (3592); d., Quantock Venus 10th (14,813); s. of d., Bridgwater.

**CLASS 47.—Devon Heifer, calved in 1899. [5 entries.]**

**I (£10).—E. J. STANLEY, M.P.,** Quantock Lodge, Bridgwater, **Quantock Beauty 16th** (17,172), born January 23, 1899; s., Tregothnan (2902); d., Beauty 9th (12,118); s. of d., Duke of Wellington (1955).

**II (£5).—BOVINE, LIMITED, 44–47, Bishopsgate Street, Without, London, F.C.,** Bovine Princess, born June 4, 1899, bred by E. J. Stanley, M.P., Quantock Lodge, Bridgwater; s., Quantock Jubilee (3943); d., Quantock Princess 2nd (14,810); s. of d., Duke of Bridgwater (3258).

**III (£2).—Hon. E. W. B. PORTMAN, Hestercombe, Taunton, Somerset,** Hestercombe Roseleaf (17,049), born May 4, 1899; s., Lord Passmore 9th of Pound (3917); d., Roseleaf (15,334); s. of d., Duke of Currypool (3096).

**R. & H. C.—A. BOWERMAN, Capton, Williton, Capton Belle,** born January 20, 1899; s., Lord Culverhay (3469); d., Honesty (14,971); s. of d., Starlight (3514).

**CLASS 48.—Devon Heifer, calved in 1900. [7 entries.]**

**I (£10).—R. W. C. EVERED, Cridlands, Spaxton, Bridgwater,** Princess 4th, born June 18, 1900; s., Quantock Bridegroom (4097); d., Quantock Princess 2nd (14,810); s. of d., Duke of Bridgwater (3258).

**II (£5).—A. BOWERMAN, Capton, Williton, Taunton, Capton Apricot,** born January 4, 1900; s., Harold 4th (3595); d., Apricot (13,743); s. of d., Palmerston (2474).

**III (£2).—J. C. WILLIAMS, Caerhays, St. Austell, born February 18, 1900; s., Afterthought (3875); d., Waterlily 19th (15,514); s. of d., Captain (2204).**

**R. & H. C.—Hon. E. W. B. PORTMAN, Hestercombe, Taunton, Somerset,** Hestercombe Roseleaf 2nd, born April 29, 1900; s., Duke of Pound 29th (3725); d., Roseleaf (15,344) s. of d., Duke of Currypool (3096).

**C.—A. BOWERMAN, Capton Duchesse, born January 6, 1900; s., Lord Culverhay (3469); d., Duchesse (15,196); s. of d., Harold 3rd (3127):—Col. A. F. WALTER, Bear Wood, Wokingham, Berks, Bear Wood Countess, born May 19, 1900; s., Councillor (3407); d., Fairfield Mangold (14,481); s. of d., Harold (2790):—and J. C. WILLIAMS, born April 6, 1900; s., Robert George (3801); d., Fashion 6th (15,517); s. of d., Pretty Middling 2nd (3172).**

[CLASS COMMENDED.]

**SHORTHORN.**

**CLASS 49.—Shorthorn Bull, calved in 1897 or 1898. [5 entries.]**

**I (£10) and Champion (£10).—G. HARRISON, Gainford Hall, Darlington, roan, Inspector (72,715),** born April 23, 1897, bred by A. Crombie, Woodend, Summerhill, Aberdeenshire; s., Granite City (70,570); d., Roan Lady; s. of d., Standard Bearer (55,096).

\* Given by the Shorthorn Society for Best Bull in Class 49, 50, or 51, entered in or eligible for Coates's Herd Book.

**II. (£5.)**—H. K. COLVILLE, Bellaport Hall, Market Drayton, red, **Royal Seal** (75,543), born January 27, 1897, bred by W. Henderson, Haydon Bridge, Cumberland; s., Cornelius (66,864); d., Rosebud 6th; s. of d., St. Clair (61,742).

**R. & H. C.**—J. D. WILLIS, Bapton Manor, Codford, Wilts, roan, **Regulator**, born January 6, 1897, bred by Mac. Gillivray, Fettes, N.B.; s., Twinkling Star (64,931); d., Ripe Strawberry; s. of d., British Leader (60,417).

**C.**—J. COLMAN, Gatton Park, Surrey, roan, **Langford Lavender** (74,819), born January 11, 1898, bred by S. Hill, Langford House, Langford, Bristol; s., Wiltshire Victor (71,883); d., Lavender Gem; s. of d., Xmas Present (63,793).

**CLASS 50.—Shorthorn Bull, calved in 1899. [14 entries.]**

**I. (£15) and R. for Champion.\***—H. DUDDING, Riby Grove, Stallingborough, Great Grimsby, Lincolnshire, roan, **Ingram's Perfection**, born February 19, 1899, bred by A. Dobson, Williams-gill, Westmorland; s., Ingram's Crown (70,648); d., Golden Duchess 16th; s. of d., Ingram's Hope (61,009).

**II. (£10.)**—W. J. HOSKEN, Loggan's Mill, Hayle, Cornwall, red, **Duke of Hayle**, born June 15, 1899; s., Treforrest (63,452); d., Arc Gwynne 4th; s. of d., Fireball (64,025).

**III. (£5.)**—Colonel MAKINS, Rotherfield Court, Henley-on-Thames, red and little white, **Rotherfield Augustus** (77,692), born February 14, 1899, bred by the late J. Bruce, Inverquhomery, Aberdeenshire; s., Waverley (68,072); d., Augusta 61st; s. of d., Cap-a-Pie (58,591).

**R. & H. C.**—G. HARRISON, Gainford Hall, Darlington, roan, **Gainford First Favourite**, born January 27, 1899; s., Cornelius (66,864); d., Flower of Fife; s. of d., Fitz Fife (64,026).

**H. C.**—G. F. KING, Chewton Keynsham, red, **Chewton Victor** (76,343), born May 14, 1899; s., Viceroy (73,814); d., Countess 25th; s. of d., Blair Athol (60,367):—and LORD TREDEGAR, Tredegar Park, near Newport, Monmouthshire, white, **Prince Alto** (77,467), born February 3, 1899; s., Alto (68,147); d., Rose of Tredegar; s. of d., Comet 4th (62,313).

**CLASS 51.—Shorthorn Bull, calved in 1900. [13 entries.]**

**I. (£12.)**—G. HARRISON, Gainford Hall, Darlington, roan, **Silver Ball**, born January 20, 1900, bred by W. Duthie, Collynie, Aberdeenshire; s., Silver Plate (75,633); d., Bright Belle; s. of d., Leon (49,860).

**II. (£5.)**—J. D. WILLIS, Bapton Manor, Codford, roan, **Sovereign**, born May 3, 1900; s., Prince of Sanquhar (71,251); d., Spicy 13th; s. of d., Masterstroke (57,751).

**III. (£2.)**—H. DUDDING, Riby Grove, Stallingborough, Great Grimsby, Lincolnshire, red, **Victor**, born January 5, 1900, bred by Lord Lovat; s., Royal Star (71,502); d., Beaufort Pride; s. of d., Proud Duke (59,713).

**R. & H. C.**—W. J. HOSKEN, Loggan's Mill, Hayle, Cornwall, red, **Duke of Cornwall**, born March 3, 1900; s., Treforrest (63,452); d., Wild Duchess 8th; s. of d., Cornish Duke (55,500).

\* Given by the Shorthorn Society for Best Bull in Class 49, 50, or 51, entered in or eligible for Coate's Herd Book.

**H. C.**—G. F. KING, Chewton Keynsham, Bristol, roan, **Lord Bruce**, born April 17th, 1900; s., Chewton Oxford Cornelius (74,223); d., Evelyn; s. of d., Beau Ideal (63,686).

**C.**—LORD CALTHORPE, Elvetham Park, Winchfield, Hants, red roan, **Merman**, born January 23, 1900, bred by her late Majesty the Queen, Shaw Farm, Windsor; s., Prince Victor (73,320); d., Maid of Marmion, s. of d., Gael (60,855).

**CLASS 52.—Shorthorn Cow, in-Milk, calved before 1898.**

[6 entries.]

**I. (£15.)**—Colonel MAKINS, Rotherfield Court, Henley-on-Thames, white, **Welsh Gem** (vol. xlv. p. 520), born March 15th, 1893, bred by the Marquis of Bute, Cardiff Castle; s., Unionist (60,093); d., Bright Gem; s. of d., Lord Granville.

**II. (£10.)**—LORD TREDEGAR, Tredegar Park, near Newport, Monmouthshire, white, **Snowdrop 8th**, born February 26, 1893; s., Field Officer (58,947); d., Snowdrop 4th; s. of d., Bellerophon (47,472).

**R.**—LORD CALTHORPE, Elvetham Park, Winchfield, Hants, roan, **Fanny B 22nd**, born March 17, 1894, bred by Sir A. H. Grant, Bart., Monymusk, Aberdeenshire; s., Martin (64,407); d., Fanny B 16th; s. of d., Earl of Moray (43,171).

**CLASS 53.—Pure Bred Pedigree Shorthorn Dairy Cow, in-Milk, of any age, eligible for and entered in Coates's Herd Book (or pedigree sent for such entry before the Show), that had not previously won a First Prize given by the Shorthorn Society in a corresponding Class.** [6 entries.]

(The First Prize in Class 53 was given by the Shorthorn Society.)

**I. (£10.)**—LORD ROTHSCHILD, Tring Park, Herts, red, **Princess Rose**, born February 25, 1895, bred by A. Dobson, Williamsgill Temple, Sowerby; s., Crown Prince (60,566); d., Rose; s. of d., General Ingram (51,312).

**II. (£5.)**—LORD TREDEGAR, Tredegar Park, near Newport, Monmouthshire, white, **Snowdrop 8th**, born February 26, 1893; s., Field Officer (58,947); d., Snowdrop 4th; s. of d., Bellerophon (47,472).

**R.**—LORD CALTHORPE, Elvetham Park, Winchfield, Hants, roan, **Fanny B 22nd**, born March 17, 1894, bred by Sir A. H. Grant, Bart., Monymusk, Aberdeenshire; s., Martin (64,407); d., Fanny B 16th; s. of d., Earl of Moray (43,171).

**CLASS 54.—Shorthorn Heifer, in-Milk, calved in 1898.** [4 entries.]

**I. (£10.)**—J. D. WILLIS, Bapton Manor, Codford, white, **White Heather**, born February 1, 1898, bred by J. B. Manson, Kilbrann, N.B.; s., Merrymason (67,486); d., Beauty 24th; s. of d., Morton (53,330).

**II. (£5.)**—Sir J. B. MAPLE, Bart., M.P., Childwick, St. Albans, roan, **May Duchess 25th**, born June 14, 1898; s., Sir Launcelot; d., May Duchess 24th; s. of d., Prince Whiteflank 2nd.

**R.**—H. DUNDING, Riby Grove, Stallingborough, Great Grimsby, Lincs., roan, **Fairy Belle 8th**, born May 17, 1898, bred by W. H. Tremaine, Sherborne, Northleach; s., Count Clarence 2nd (72,270); d., Fairy Belle 5th; s. of d., Royal Nottingham 3rd (63,274).

**CLASS 55.—*Shorthorn Heifer, calved in 1899.* [11 entries.]**

**I. (£10.)**—J. COLMAN, Gatton Park, Surrey, roan, **Hawthorn Gem 3rd**, born January 7, 1899, bred by W. Atkinson, Overthwaite, Milnthorpe; s., Cairo (72,151); d., Hawthorn Gem 2nd (vol. xlv. p. 296); s. of d., Baron Bloom (66,653).

**II. (£5.)**—G. HARRISON, Gainford Hall, Darlington, roan, **Village Queen**, born April 12, 1899, bred by W. Duthie, Collynie, Aberdeenshire; s., Village Archer (71,789); d., Interlude 13th; s. of d., Vice Chancellor (56,681).

**III. (£2.)**—W. J. HOSKEN, Loggan's Mill, Hayle, Cornwall, red, **Wild Duchess 20th**, born October 4, 1899; s., Monocrat (67,505); d., Wild Duchess 11th; s. of d., Duke of Wellington (63,923).

**R. & H. C.**—H. DUDDING, Riby Grove, Stallingborough, Great Grimsby, Lincolnshire, roan, **Ombersley Pride**, born February 15, 1899, bred by — Wynne, Brick House Farm, Hadley, Droitwich; s., Bridegroom 3rd (72,094); d., Oman; s. of d., Fairy King (65,479).

**H. C.**—H. DUDDING, roan, **Floradora**, born May 6, 1899, bred by — Hume, Barrelwell, Brechen, N.B.; s., Brinach (72,132); d., Flood; s. of d., Violet Chief (66,474).

**CLASS 56.—*Shorthorn Heifer, calved in 1900.* [17 entries.]**

**I. (£10.)**—LORD CALTHORPE, Elvetham Park, Winchfield, Hants, roan, **Elvetham Harebell**, born March 17, 1900; s., Prince of Sanquhar (71,251); d., Hilda Quadroon; s. of d., Gaelic Knight (58,991).

**II. (£5.)**—J. D. WILLIS, Bapton Manor, Codford, roan, **Bapton Jewel**, born January 16, 1900; s., Royal Jeweller (75,527); d., Jessamine; s. of d., Bapton Javelin (68,176).

**III. (£2.)**—W. J. HOSKEN, Loggan's Mill, Hayle, Cornwall, roan, **Lady Blithfield 12th**, born January 5, 1900; s., Treforrest (63,452); d., Lady Blithfield 8th; s. of d., Duke of Tringunter 10th (54,224).

**R. & H. C.**—J. THORLEY, Ringdale House, Faringdon, Berks, roan, **There's 'Air**, born March 5, 1900, bred by J. Hobbs, Maisy Hampton, Gloucestershire; s., Councillor (72,264); d., Chorus 47th; s. of d., King of Hoxton 13th (64,223).

**C.**—J. COLMAN, Gatton Park, Surrey, roan, **Lady Rose**, born January 12, 1900, bred by T. Mace, Eastleach, Lechlade, Gloucestershire; s., Rose Knight (75,479); d., Rosa (H.B., vol. xlvii.); s. of d., Adonis Foggathorpe (69,849);—and W. NICHOLSON, Basing Park, Alton, Hants, white, **Princess 66th**, born March 17, 1900; s., Audacious (73,968); d., Princess 61st; s. of d., Aristotle (65,083).

**HEREFORD.****CLASS 57.—*Hereford Bull, calved in 1897 or 1898.* [4 entries.]**

**I. (£10.)**—EARL of COVENTRY, Croome Court, Worcester, **Mercury** (20,192), born March 17, 1898; s., Viscount (18,648); d., Minerva 2nd; s. of d., Good Boy (7668).

**II. (£5.)**—H. W. TAYLOR, Showle Court, Ledbury, **Sorcerer** (20,339), born February 23, 1898, bred by A. P. Turner, The Leen, Pembridge, Herefordshire; s., Clarence (15,944); d., Spredwell; s. of d., Statesman (14,938).

**III. (£2.)**—W. H. DAVIES, Claston and Livers Ocle, Hereford, **Admiral** (19,183), born February 6th, 1897, bred by the late C. Ricketts, Trebaried, Talgarth, Breconk; s., Letton Hardwick (16,806); d., Water Lily; s. of d., Bacho (5732).

**R.**—R. GREEN, The Whittern, Kington, **Whittern Sovereign**, born January 11, 1898; s., Dip Comet (18,328); d., Sylvania; s. of d., Pioneer (16,269).

**CLASS 58.—Hereford Bull, calved in 1899. [10 entries.]**

**I. (£15.)**—J. TUDGE, Duxmoor, Craven Arms, Salop, **Albany**, born January 25, 1899, bred by A. E. Hughes, Wintercott, Leominster; s., Albion (15,027); d., Luna 2nd (vol. xxiv. p. 425); s. of d., Cheerful (6351).

**II. (£10.)**—Sir J. PULLEY, Bart., Lower Eaton, Hereford, **Eaton Defender 12th** (20,602), born March 26, 1899; s., Strafford (14,946); d., Cormis 2nd; s. of d., Bear (10,974).

**III. (£5.)**—Captain E. L. A. HEYGATE, Buckland, Leominster, **Iron Duke** (20,717), born February 22, 1899; s., Iron King (18,884); d., Cherry Ripe (vol. xxxi. p. 403); s. of d., Thickset (17,574).

**R.**—A. P. TURNER, The Leen, Pembridge, Herefordshire, **Gilderoy** (20,653), born March 25, 1899; s., Pagan (18,510); d., Gwendoline; s. of d., Merlin (7851).

**H. C.**—EARL OF COVENTRY, Croome Court, Worcester, **Vishnu** (21,100), born March 7th, 1899; s., Viscount (18,048); d., Vivandiere; s. of d., Senator (14,896).

**C.**—T. FENN, Stonebrook House, Downton, Ludlow, **Survivor** (21,045), born January 20th, 1899; s., Royalist 4th (17,501); d., Lesbia (vol. xxv. p. 303); s. of d., Launcelot (13,917):—and E. J. WYTHES, Copped Hall, Epping, **Copped Hall Politician**, born January 21, 1899; s., Monitor (17,973); d., Polly (vol. xxx. p. 434); s. of d., Barrington 2nd (17,104A).

**CLASS 59.—Hereford Bull, calved in 1900. [9 entries.]**

**I. (£12.)**—A. E. HUGHES, Wintercott, Leominster, **Nelson**, born January 23, 1900; s., Glendower (20,042); d., Nelly; s. of d., Albion (15,027).

**II. (£5.)**—A. E. HUGHES, Lambton, born January 18, 1900; s., Nonpareil (19,614); d., Lofty 2nd; s. of d., Seabreeze (14,153).

**III. (£2.)**—W. T. BARNEY, Saltmarshe Castle, Bromyard, **Obelisk**, born February 4, 1900; s., Happy Hampton (16,097); d., Fair Spark (vol. xxix. p. 197); s. of d., Iroquois (7039).

**R.**—EARL OF COVENTRY, Croome Court, Worcester, **Vatican**, born January 8, 1900; s., Gaudy Prince (19,425); d., Viscountess; s. of d., Viscount (18,648).

**C.**—T. FENN, Stonebrook House, Downton, Ludlow, **Loadstone** (vol. xxxii.), born January 11, 1900; s., Royalist 4th (17,501); d., Lesbia (vol. xxv. p. 303); s. of d., Launcelot (13,917):—and H. W. TAYLOR, Showle Court, Ledbury, **Contraband**, born March 23, 1900; s., Sorcerer (20,339); d., Idalus; s. of d., Prince Charles (16,293).

**CLASS 60.—Hereford Cow, in-Milk, calved before 1898. [2 entries.]**

**I. (£15.)**—J. TUDGE, Duxmoor, Craven Arms, Salop, **Rustic Maid**, born April 9, 1897, bred by the late T. Myddleton, Llynaven; s., Plough-boy (17,424); d., Miss Nobleman 21st (vol. xxvi. p. 506); s. of d., Liberal Tom (7085).

**CLASS 61.—Hereford Heifer, in-Milk, calved in 1898. [4 entries.]**

**I. (£10.)**—R. GREEN, The Whittern, Kington, **Waterweed**, born February 17, 1898; s., Diplomat (18,328); d., Westeria; s. of d., Pioneer (16,269).

**II. (£5.)**—W. H. DAVIES, Claston and Livers Ocle, Hereford, **Julia 3rd**, born February 27, 1898; s., North Western (18,503); d., Julia; s. of d., Promiser (15,595).

**III. (£2.)**—J. TUDGE, Duxmoor, Craven Arms, Salop, **Dora Bell**, born February 8, 1898; s., Gold Box (15,339); d., Dora (vol. xxvii. p. 577); s. of d., Silurian (16,993).

**R. & C.**—J. TUDGE, **Bracelet**, born January 6, 1898; s., Gold Box (15,339); d., Coral Gem; s. of d., Reginald (14,089).

**CLASS 62.—Hereford Heifer, calved in 1899. [3 entries.]**

**I. (£10.)**—J. TUDGE, Duxmoor, Craven Arms, Salop, **Princess Royal**, born May 3, 1899; s., Viscount Rupert (19,789); d., Golden Pippen (vol. xxiii. p. 680); s. of d., Alton (11,877).

**II. (£5.)**—H. W. TAYLOR, Showle Court, Ledbury, **Ladysmith**, born February 10, 1899; s., Restorer (19,681); d., Clarissa; s. of d., Mohican (8919).

**CLASS 63.—Hereford Heifer, calved in 1900. [10 entries.]**

**I. (£10.)**—R. GREEN, The Whittern, Kington, **Maysie**, born January 16, 1900; s., Curly Boy (17,793); d., Marjory; s. of d., Sterling (14,943).

**II. (£5.)**—R. GREEN, **Lady Prand**, born January 22, 1900; s., Curly Boy (17,793); d., Lady Helen; s. of d., Pioneer (16,269).

**III. (£2.)**—W. H. DAVIES, Claston and Livers Ocle, Hereford, **Delicacy**, born March 6, 1900; s., Admiral (19,183); d., Dainty 8th; s. of d., Duke (11,177).

**R.**—J. TUDGE, Duxmoor, Craven Arms, Salop, **Royal Gem**, born January 7, 1900; s., Francis (13,800); d., Coral Gem (vol. xxii. p. 715); s. of d., Reginald (14,089).

**H. C.**—A. R. FIRKINS, l'aunton Court, Bishops Frome, Herefordshire, **Cornelia 6th**, born January 15, 1900; s., Lurdan (20,175); d., Cornelia 3rd; s. of d., Pink Boy (10,406):—and A. E. HUGHES, Wintercott, Leominster, **Bartonia**, born February 3, 1900; s., Nonpareil (19,614); d., Barbara 6th; s. of d., Albion (15,027).

**C.**—R. PALMER, Lodge Farm, Nazeing, Waltham Cross, Essex, **Destiny**, born February 8, 1900; s., Sophism (18,615); d., Daisy Bell 3rd; s. of d., Truant (15,758):—E. J. WYTHES, Copped Hall, Epping, **Copped Hall Princess**, born January 15, 1900; s., Typewriter (20,377); d., Downton Pride (vol. xxix. p. 646); s. of d., Launcelot (13,917):—and his **Copped Hall Primrose**, born January 27, 1900; s., Typewriter (20,377); d., Copped Hall Pride (vol. xxx. p. 558); s. of d., Monitor (17,973).

# SUSSEX.

## CLASS 64.—*Sussex Bull, calved in 1897 or 1898. [6 entries.]*

**I. (£10) and Champion (£10 10s.).\***—Hon. R. P. NEVILL, Birling Manor, West Malling, Kent, **Confidence 2nd** (1630), born January 3, 1898; s., Confidence (1498); d., Lady Lyne (4507); s. of d., Papa (709).

**II. (£5).**—E. E. BRABY, Drungewick Manor House, Rudgwick, Sussex, **Drungewick Prebble** (1666), born December 9th, 1898, bred by the late F. Warde, Aldon, West Malling, Kent; s., Aldon 2nd (1451); d., Aldon Prebble (6056); s. of d., Red Hill Gold Dust (927).

**III. (£2).**—P. F. R. SAILLARD, Buchan Hill, Crawley, Sussex, **Aldon 3rd**, (1639), born February 15, 1898, bred by the late F. Warde, Aldon, Addington, West Malling, Kent; s., Aldon 2nd (1451); d., Aldon Bluebell (6047); s. of d., King Alfred.

**R. & H. C.**—EARL OF DERBY, Birtley, Witley, Surrey, **Nero** (1615), born July 29, 1898; s., Proud Prince (1249); d., Noblesse (3078); s. of d., Drungewick (456).

**C.**—J. GODMAN, Park Hatch, Godalming, Surrey, **Prince Napier 2nd** (1620), born June 10, 1898; s., Lord George Napier (1372); d., Noble Lady 14th (6805); s. of d., Prince John (1261).

## CLASS 65.—*Sussex Bull, calved in 1899 or 1900. [6 entries.]*

**I. (£15).**—P. F. R. SAILLARD, Buchan Hill, Crawley, Sussex, **Bewbush Marquis** (1720), born March 14, 1899; s., Bewbush King (1575); d., Galatea 5th (6931); s. of d., What's Wanted (1329).

**II. (£10).**—EARL OF DERBY, Birtley, Witley, Surrey, **Graser** (1684), born August 22, 1899; s., Diploma (1540); d., Gladstone 3rd (4008); s. of d., Oxford 2nd (771).

**III. (£5).**—Captain R. ALEXANDER, Wilsley, Cranbrook, Kent, **Buckhurst 2nd** (1653), born April 10, 1899; s., Geoffrey (1375); d., Nipicar Lady (5751); s. of d., Knight of Woodmancote 3rd (965).

**C.**—W. W. HUBBLE, The Elms, Hunton, near Maidstone, **Lieutenant 3rd** (1759), born January 16, 1900; s., Lieutenant (1362); d., Laura A 6th of Haslemere (6119); s. of d., Sir John of Jayes (1155);—and P. F. R. SAILLARD, **Bewbush Marquis 2nd** (vol. xvi.), born May 21, 1900; s., Bewbush King (1575); d., Galatea 3rd (6006); s. of d., Lord Oxeye (954).

## CLASS 66.—*Sussex Cow or Heifer, calved in or before 1898.*

[5 entries.]

**I. (£15).**—EARL OF DERBY, Birtley, Witley, Surrey, **Cinderella** (7067), born April 6, 1896; s., Proud Prince (1249); d., Cuckoo (5462); s. of d., Frank (997).

**II. (£10).**—P. F. R. SAILLARD, Buchan Hill, Crawley, Sussex, **Maud** (6928), born March 10, 1895; s., Silversmith 2nd (1115); d., Cheery Tart (1662); s. of d., Saracen 2nd (1032).

**III. (£5).**—F. J. MAITLAND, Friston Place, Eastbourne, **Aldon Woodmancote 3rd**, born January 19, 1897, bred by F. Warde, Malling, Kent; s.,

\* Given by Sussex Breeders for Best Bull in Class 64 or 65.

Goldfinch (1277); d., Aldon Woodmancote 1st (6668); s. of d., Headly (1201).

**CLASS 67.—*Sussex Heifer, calved in 1899.* [7 entries.]**

**I. (£10) and Champion (£10 10s.).\***—W. F. CAMPBELL, Brantridge Park, Balcombe, **Brantridge Ballet 3rd** (7897), born June 16, 1899; s., Ensign (1584); d., Brantridge Ballet (7327); s. of d., Limehurst Duke 2nd (1294).

**II. (£5).**—W. W. HUBBLE, The Elms, Hunton, near Maidstone, **Peony** (7990), born January 5, 1899; s., Lieutenant (1362); d., Perrywinkle (7219); s. of d., Oxford Duke 1st (840).

**III. (£2).**—J. GODMAN, Park Hatch, Godalming, **Noble Lady 24th** (7953), born March 3, 1899; s., Lord George Napier (1372); d., Noble Lady 12th (6527); s. of d., Oxford Duke 6th (1188).

**R. & V. H. C.**—P. F. R. SAILLARD, Buchan Hill, Crawley, Sussex, **Bewbush Princess** (8070), born July 5, 1899; s., Bewbush King (1575); d., Cherry Tart (5662); s. of d., Saracen (1032).

**CLASS 68.—*Sussex Heifer, calved in 1900.* [9 entries.]**

**I. (£10) and R. for Champion.\***—EARL OF DERBY, Birtley, Witley, Surrey, **Firle Valentine** (8195); born February 14, 1900; s., Leap Year (1483); d., Firle 6th (4910); s. of d., Young Rival (658).

**II. (£5).**—P. F. R. SAILLARD, Buchan Hill, Crawley, Sussex, **Bewbush Wind 2nd** (vol. xvi.), born January 5, 1900; s., Alfred (1637); d., Wind 4th (6935); s. of d., Silversmith 2nd (1115).

**III. (£2).**—W. W. HUBBLE, The Elms, Hunton, near Maidstone, **Mimosa** (8262), born January 17, 1900; s., Lieutenant (1362); d., Minerva (7217); s. of d., Oxford Duke 1st (840).

**R. & V. H. C.**—G. WARDE, Tutsham Hall, West Farleigh, Maidstone, **Tutsham Dulcimer 3rd**, born January 2, 1900; s., Headley (1201); d., Tutsham Dulcimer (7482); s. of d., Goldfinch (1277).

**RED POLLED.**

(The Red Polled Cattle Society contributed £45 towards the Prizes in Classes 69 to 73.)

**CLASS 69.—*Red Polled Bull, calved in 1897 or 1898.* [4 entries.]**

**I. (£10).**—J. E. PLATT, Howbury Hall, near Bedford, **Champion** (5370), born January 1st, 1897, bred by G. Taylor, Trowse House, Norwich; s., Red Prince (2902); d., Coronet 2nd (5367); s. of d., Iago (1025).

**II. (£5).**—LORD AMHERST OF HACKNEY, Didlington Hall, Brandon, Norfolk, **Redvers** (6570), born March 12, 1898, bred by the late J. J. Colman, Norwich; s., Rosy Boy (4627); d., Telba (8251); s. of d., Game Boy (2315).

**R. & H. C.**—J. E. PLATT, **Red Knight** (5818), born February 9th, 1897, bred by the late J. J. Colman, Carrow House, Norwich; s., Ruby Prince (4131); d., Silent Anna (8978); s. of d., Ruby King (2925).

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\* Given by the Sussex Breeders for Best Cow or Heifer in Class 66, 67, or 68.

**H. C.**—F. H. BAXENDALE, J.P., Framfield Place, Uckfield, Sussex, **Carshalton** (6866), born June 10th, 1898, bred by the late F. E. Colman, Nork Park, Epsom Downs; s., Lord Nork (4010); d., Cassandra (9183); s. of d., Fred (2308).

**CLASS 70.—Red Polled Bull, calved in 1899 or 1900. [5 entries.]**

**I. (£15).**—LORD AMHERST OF HACKNEY, Didlington Hall, Brandon, Norfolk, **Defiance** (6966), born January 1st, 1899, bred by R. H. Mason, Necton Hall, Swaffham, Norfolk; s., Magician (5021); d., Dorothy (7063); s. of d., Erebus (841).

**II. (£10).**—R. P. COOPER, Ashlyn's, Berkhamstead, Herts, **Felix**, born January 1st, 1899, bred by G. Taylor, Trowse House, Norwich; s., Starston Croesus; d., Fillpail 2nd.

**R. & H. C.**—J. E. PLATT, Howbury Hall, near Belford, **Pistol**, born January 19, 1900; s., Champion (5370); d., Bruna (12,030); s. of d., Ruby Prince (4131).

**C.**—H.R.H. THE DUKE OF CORNWALL AND YORK, K.G., Sandringham, **Field Ranger**, born January 2nd, 1899; s., Ranger (5128); d., Midnight (7314); s. of d., Davyson 42nd (1776):—and J. B. D. MMOCK, Shotford Hall, Harleston, Norfolk, **Shotford Favourite**, born May 14th, 1900; s., Starston Sirdar (6687); d., Trustful 2nd (13,049); s. of d., Wigton (4703).

**CLASS 71.—Red Polled Cow or Heifer, in-Milk, calved in or before 1898. [4 entries.]**

**I. (£15).**—J. E. PLATT, Howbury Hall, Bedford, **Dormouse** (13,419), born April 22, 1898, bred by the late J. J. Colman, Carrow House, Norwich; s., Redman (5147); d., Dorena (6308); s. of d., Iago (1025).

**II. (£10).**—J. E. PLATT, **Red Lass** (14,121), born January 23, 1898, bred by the late J. J. Colman; s., Rosy Boy (4627); d., Red Top (8911); s. of d., Red Prince (2902).

**R. & H. C.**—R. P. COOPER, Ashlyn's, Berkhamstead, Herts, **Lady Ruby**, born January 23, 1897, bred by the late J. J. Colman; s., Ruby Prince; d., Red Top; s. of d., Red Prince.

**CLASS 72.—Red Polled Heifer, calved in 1899. [5 entries.]**

**I. (£10).**—J. E. PLATT, Howbury Hall, Bedford, **Tiara** (15,959), born January 31, 1899, bred by the late J. J. Colman, Carrow House, Norwich; s., Champion (5370); d., Necklace (11,610); s. of d., Red Prince (2902).

**II. (£5).**—J. E. PLATT, **Miss Poppy 3rd** (15,453), born January 6, 1899; s., Caistor Mincemeat (4289); d., Miss Poppy (6575); s. of d., Cromwell (647).

**R. & H. C.**—F. H. BAXENDALE, J.P., Framfield Place, Uckfield, Sussex, **Sarah** (17,851), born November 7, 1899, bred by G. E. Hawkins, Leziate, King's Lynn; s., The Count (5394); d., Sherry 4th (12,962); s. of d., Parishioner (3238).

**CLASS 73.—Red Polled Heifer, calved in 1900. [6 entries.]**

**I. (£10).**—J. E. PLATT, Howbury Hall, near Bedford, **Sleeping Beauty**, born March 1, 1900, bred by the late F. Colman, Nork Park,

Epsom Downs; s., Red Knight (5818); d., Girl (9377); s. of d., Albion (2982).

**II. (£5.)**—J. B. DIMMOCK, Shotford Hall, Harleston, Norfolk, **Shotford Duchess**, born February 19, 1900, bred by Duchess of Hamilton, Easton Park, Suffolk; s., Bismark (6004); d., Graceful 3rd (11,307); s. of d., Caiston Spark (3413).

**III. (£2.)**—LORD AMHERST OF HACKNEY, Didlington Hall, Brandon, Norfolk, **Popsey 6th**, born March 19, 1900; s., Redvers (6570); d., Poppety 2nd (4289); s. of d., Didlington Davyson 2nd (657).

**R. & H. C.**—J. E. PLATT, **Meddlesome Mattie**, born May 11, 1900; s., Champion (5370); d., Minnie (8045); s. of d., Earl (2279).

### ABERDEEN-ANGUS.

(The First Prizes in Classes 74 to 78 were given by the English Aberdeen-Angus Cattle Association.)

#### CLASS 74.—*Aberdeen-Angus Bull, calved before December 1st, 1899.*

[10 entries.]

**I. (£7.)**—Rev. C. BOLDEN, Preston Bissett, Buckingham, black, **Proud Duke of Ballindalloch** (12,031), born May 8, 1894, bred by Sir G. M. Grant, Bart., Ballindalloch Castle, N.B.; s., Prince Inca (7844); d., Pride of Dalmore (13,914); s. of d., The Black Knight (1809).

**II. (£5.)**—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, black, **Elate** (16,513), born December 14, 1898, bred by A. Egginton, South Ella, Hull; s., Mailbag (13,637); d., Elise (24,028); s. of d., Eshros (10,816).

**III. (£2.)**—Sir J. B. MAPLE, Bart., M.P., Childwick, St. Albans, Herts, black, **Lamplighter of Southgate** (14,570), born January 28, 1897, bred by F. Crisp, White House, New Southgate, London, N.; s., Gilderoy (9208); d., Lilius 8th of Wester Fowlis (22,399); s. of d., Prince Albert of W. Fowlis (1492).

**R. & H. C.**—G. J. DRUMMOND, Swaylanda, Penshurst, Kent, black, **Gay Luck**, born March 7, 1899, bred by A. Egginton, South Ella, Hull; s., Mailbag (13,637); d., Gay Lass 19th (22,855); s. of d., King of Paris (6869).

**C.**—C. W. S. WHITBURN, Addington Park, West Malling, Kent, black, **Kilgarston** (15,610), born December 23, 1897, bred by Sir G. McPherson Grant, Ballindalloch, Banffshire, N.B.; s., Prospero (11,208); d., Kindred (12,436); s. of d., Errol (2723).

#### CLASS 75.—*Aberdeen-Angus Bull, calved on or after December 1st, 1899.* [9 entries.]

**I. (£10.)**—J. H. BRIDGES, Langshott, Horley, Surrey, black, **Darlington** (17,679), born December 23, 1899; s., Breckan (15,235); d., Daric (25,412); s. of d., Eimeo (12,450).

**II. (£7.)**—G. F. STANFORD, Worthing Road, Horsham, black, **Santoy**, born December 7, 1899; s., Burnatum (15,248); d., Blackcrest (25,429); s. of d., Prince Iliad (7091).

**III. (£3.)**—R. W. HUDSON, Danesfield, Great Marlow, black, **Primus of**

**Danesfield**, born February 11, 1900; s., Junior Jehu (14,536); d., Pride's Flower (22,374); s. of d., Cerberus (8181).

**R. & H. C.**—F. CRISP, D.L., J.P., White House, New Southgate, N., black, **Extractor** (17,823), born January 16, 1900, bred by C. Stephenson, Sandford Villa, Newcastle-on-Tyne; s., Esmond of Ballindalloch (8304); d., Extract (23,528); s. of d., Cerberus (8181).

**C.**—C. W. SCHROETER, Tedfold, Billingshurst, Sussex, black, **Perpignan** (P.H.B., vol. xxv.), born December 6, 1899; s., Epigram of Cortachy (8292); d., Pride of Hailes (22,944); s. of d., Egerton (10,796).

**CLASS 76.—Aberdeen-Angus Cow or Heifer, in-Milk, calved before December 1st, 1896. [4 entries.]**

**I. (£10).**—R. W. HUDSON, Danesfield, Great Marlow, black, **Lady May of Advie** (25,526), born January 15, 1896, bred by J. Grant, Advie Manis, Advie; s., Provost of Advie (11,217); d., Lady Love of Advie (21,846); s. of d., Rustler (8761).

**II. (£7).**—J. H. BRIDGES, Langshott, Horley, Surrey, black, **Cambria 5th** (27,025), born January 6, 1898, bred by R. W. Hudson, Danesfield, Great Marlow, Berks; s., Eric Macdonald (12,475); d., Cambria 3rd (12,311); s. of d., Erroll (2723).

**III. (£3).**—W. B. GREENFIELD, Haynes Park, Bedford, black, **Tedfold Favourite 6th** (24,676), born December 16, 1895, bred by C. W. Schroeter, Tedfold, Billingshurst, Sussex; s., Epigram of Cortachy (8292); d., Tedfold Favourite 2nd (20,989); s. of d., Romeo of Advie (9588).

**R. & H. C.**—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, black, **Pride 13th of Kippendaire**, born February 16, 1898, bred by the late Col. Stirling, Kippendaire, Scotland; s., Norfolk 5th (7022); d., Pride of Kippendaire (14,368); s. of d., El Moro (2714).

**CLASS 77.—Aberdeen-Angus Heifer, calved on or after December 1st, 1898. [11 entries.]**

**I. (£7).**—R. W. HUDSON, Danesfield, Great Marlow, black, **Joyful of Danesfield 2nd** (28,619), born February 15, 1899; s., Eric Macdonald (12,475); d., Joyful of Ballindalloch (22,999); s. of d., Prospero of Dalmore (11,208).

**II. (£5).**—R. W. HUDSON, black, **Tippet of Danesfield 2nd** (28,623), born March 28, 1899; s., Eric Macdonald (12,475); d., Tip 2nd of Wynyard (24,787); s. of d., Ebro (8263).

**III. (£2).**—F. CRISP, D.L., J.P., White House, New Southgate, N., black, **New Girl** (28,770), born April 15, 1899, bred by G. Lowson, Balgaries, Forfarshire; s., The Missionary (13,032); d., Border Lassie (23,194); s. of d., Viscount of Kinochtry (8010).

**R. & H. C.**—C. W. S. WHITBURN, Addington Park, West Malling, Kent, black, **Roseleaf of Addington Park**, born January 2, 1899; s., Congress of Ballindalloch (14,224); d., Roseleaf 2nd of Tochiesneal (23,837); s. of d., Lictor of Blairmore.

**H. C.**—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, black, **Pride of Preston 20th**, born February 3, 1899, bred by Rev. C. Bolden, Preston Bissett, Bucks; s., Eglamore (11,618); d., Pride of Preston 4th (11,844); s. of d., Esmond of Ballindalloch (8304).

**C.**—Rev. C. BOLDEN, Preston Bissett, Buckingham, black, **Panicle** (28,404), born January 5, 1899, bred by Sir T. D. G. Carmichael, Bart., Castle Craig, Dolphinton; s., Ganymede of Ballindalloch (14,428); d., Pannad: (24,165); s. of d., Prince Iliad (7091).

**CLASS 78.—Aberdeen-Angus Heifer, calved on or after December 1st, 1899. [20 entries.]**

**I. (£7).**—R. W. HUDSON, Danesfield, Great Marlow, black, **Rhona** of Danesfield, born January 2, 1900; s., Extractorite (15,438); d., Rhona of Ballindalloch (24,211); s. of d., Prospero of Dalmore (11,208).

**II. (£5).**—R. W. HUDSON, black, **Joyful** of Danesfield 3rd, born January 11, 1900; s., Junior Jehu (14,536); d., Joyful of Ballindalloch (22,999); s. of d., Prospero of Dalmore (11,208).

**III. (£2).**—Sir J. B. MAPLE, Bart., M.P., Childwick, St. Albans, Herts, black, **Little Gem**, born January 7, 1900; s., Lamplighter of Southgate (14,570); d., Benefit 9th of Haynes (25,600); s. of d., Verdala (12,168).

**R. & H. C.**—G. OSENTON, Mariners, Westerham, Kent, black, **Colleen** of Mariners (vol. xxv.), born March 4, 1900; s., Randegger (14,909); d., Carmen of Mariners (25,927); s. of d., Mayor of Auchorachan (11,071).

**H. C.**—W. B. GREENFIELD, Haynes Park, Bedford, black, **Ettie** of Haynes 2nd, born January 28, 1900; s., Just Rover of Marlich (15,605); d., Ettie 7th (23,653); s. of d., Fred Farquhar (10,004):—G. C. GUSH, Blue House, Malden, Surrey, black, **Matilda** of Ruthven (30,971), born December 4, 1899, bred by A. D. MacRae, Ruthven, Kingussie, N.B.; s., Everest of Ballindalloch (7520); d., Mantle of Ruthven (27,217); s. of d., Emperor of Ruthven (14,340):—and G. OSENTON, black, **Pauline** of Mariners (vol. xxv.), born February 23, 1900; s., Jerningham (13,525); d., Pax (21,761); s. of d., Field Marshall of Guisachan (6727).

**C.**—Rev. C. BOLDEN, Preston Bissett, Buckingham, black, **Verity** of Preston (vol. xxv.), born January 8, 1900; s., Proud Duke of Ballindalloch (12,031); d., Vanilla of Preston (21,436); s. of d., Pommery (7069):—J. H. BRIDGES, Langshott, Horley, Surrey, black, **Pride** of Labbocks (29,675), born December 22, 1899; s., Breckan (15,325); d., Pride of Langshott (25,122); s. of d., Edric (9110):—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, black, **Boadicea** of Maisemore (vol. xxv.), born January 18, 1900; s., Eimeo (12,450); d., Bodice (23,565); s. of d., Minstrel of Glamis (11,088):—G. C. GUSH, black, **Favourite** 10th of Ruthven (vol. xxv.), born January 7, 1900, bred by A. D. MacRae; s., Earl of Ruthven (14,305); d., Young Favourite of Ruthven (13,964); s. of d., Norman of Powrie (1257):—and C. W. S. WHITBURN, Addington Park, West Malling Kent, black, **Edna** of Addington Park, born February 6, 1900; s., Kilgraston (1560); d., Ebriate (24,198); s. of d., Junior Rover (11,796).

**JERSEY.**

**CLASS 79.—Jersey Bull, calved in 1897 or 1898. [5 entries.]**

**I. (£10).**—The DUKE of MARLBOROUGH, Blenheim Palace, Woodstock, whole, **Dewey**, born August 2, 1898, bred by G. P. Ahier, Jersey; s., Reminder; d., Etna.

**II. (£5).**—F. FREEMAN THOMAS, Ratton, Willingdon, Sussex, grey brown, **Leader's Prince**, born April 24, 1898, bred by P. J. Ahier, St. Martin's, Jersey; s., Golden Ferns Lad (2160); d., Leda (6636).

**R. & H. C.**—J. BRUTTON, 7, Prince's Street, Yeovil, grey, **Dulce's Jim**, born May 13, 1898; s., Dr. Jim (5861); d., Dulce (vol. x. p. 235); s. of d., Golden Lad (3324).

**H. C.**—P. PHIPPS, Rushton Hall, Kettering, broken, **Gipsy Premier** (6229), born March 18, 1898, bred by Lord Rothschild, Tring, Herts; s., Oxford Duke (5314); d., Gipsy Queen 2nd (vol. vii. p. 202 impd.); s. of d., Golden Lad (3324).

**CLASS 80.—Jersey Bull, calved in 1899. [16 entries.]**

**I. (£15).**—E. D. STERN, Fan Court, Chertsey, Surrey, black, **Perry Farm Reminder**, born May 21, 1899, bred by J. A. Desreaux, St. Mary's, Jersey; s., Reminder (2419); d., Perry Farm Favourite (7659); s. of d., Caumais Lad (2257).

**II. (£10).**—LADY DE ROTHSCHILD, Aston Clinton, Tring, Herts, whole, **Manikin**, born November 6, 1899; s., Pontorson's Lad (6364); d., Lesser Daisy (vol. ix. p. 247); s. of d., Flora's Lad (4058).

**III. (£5).**—Col. W. A. HANKEY, Beaulieu, St. Leonard's-on-Sea, whole, **Tweedledum**, born July 26, 1899; s., Bushranger (6153); d., Zingara (vol. xi. p. 348); s. of d., Fulton King (5550).

**R. & V. H. C.**—Col. H. McCALMONT, M.P., Bishopswood, Ross, dark brown, **Chief Justice**, born July 11, 1899; s., Chancellor; d., Wigton 6th; s. of d., Flora's Lad (4098).

**V. H. C.**—Mrs. C. McINTOSH, Havering Park, Essex, dark brown, **Halburton's Prince**, born May 10, 1899, bred by P. G. Dequet, St. Saviour's, Jersey; s., Financial King (2624); s. of d., Halburton's Beauty (7676).

**H. C.**—Mrs. W. BARRON, Taplow House, Bucks, dark grey, **Darby**, born May 6, 1899, bred by C. Billot, St. Martin's, Jersey; s., Golden Fern's Lad (2160); d., Nellie Bly (7207, H.C.); s. of d., Eminent (8831):—and A. GIBBS, Tyntesfield, Bristol, whole, **Dulce's Lad**, born May 25, 1899, bred by J. Brutton, Yeovil; s., Golden Lad (5567); d., Dulce; s. of d., Golden Lad (3324).

**C.**—Col. W. A. HANKEY, whole, **Tweedledee**, born July 26, 1899; s., Bushranger (6153); d., Zingara (vol. ix. p. 348); s. of d., Fulton King (5550):—VISCOUNT ENFIELD, Dancers' Hill, South Mymms, Middlesex, whole, **Spectator**, born July 17, 1899; s., Dancers' Bismark (6618); d., Spec (vol. ix. p. 23); s. of d., Distinction's Security:—Mrs. C. M. PERKINS, Oak Dene, Holmwood, Surrey, grey, **Dundonald** (late Walter Young) (2974), born April 3, 1899, bred by J. A. Gibart, Trinity, Jersey; s., Mona's Lord (2460); s. of d., Raquette's Daisy (6448):—and W. B. RODERICK, Fronheulog, Llanelli, South Wales, grey fawn, **Spion Kop**, born March 7, 1899, bred by P. Poignaud, St. Peter's, Jersey; s., Duplex (6538); d., Pastille; s. of d., Sans Peur 5th (3776).

**CLASS 81.—Jersey Bull, calved in 1900. [27 entries.]**

**I. (£12).**—Mrs. C. McINTOSH, Havering Park, Essex, brown, **Butterman**, born June 9, 1900; s., Adonis (E.J.H.B.); d., Havering Buttercup 2nd; s. of d., Montpellier (5294).

**II. (£5).**—J. R. CORBETT, More Place, Betchworth, Surrey, grey fawn, **Edgar**, born June 21, 1900; s., Artisan (J.H.B., vol. xv. p. 2648, P.S.E.); d., Ellen 4th; s. of d., Harry 4th (5924).

**III. (£2).**—Col. H. McCALMONT, M.P., Bishopswood, Ross, dark brown,

**Chanslor**, born April 21, 1900; s., Chancellor (6500); d., Lottie; s. of d., Golden Fern's Lad (2160).

**R. & V. H. C.**—**EARL CADOGAN**, K.G., Culford Hall, Bury St. Edmunds, black and bronze, **My Lord Conceit**, born June 12, 1900; s., **Havering Pride** (6265); d., **Ladylike** (vol. vi. p. 314); s. of d., **Golden Fluke** (4557).

**V. H. C.**—**J. BRUTTON**, 7, Princes Street, Yeovil, brown and white, **Golden Star**, born June 30, 1900; s., **Mon Plaisie** (2548); d., **Western Star**; s. of d., **Lustre** (2457):—and **F. FREEMAN-THOMAS**, Ratton, Willingdon, Sussex, grey brown, **Hornbeam**, born May 8, 1900; s., **Leader's Prince** (2762); d., **Heath 9th** (232).

**H. C.**—**The LADIES E. and D. HOPE**, Great Hollenden Farm, Under-river, Sevenoaks, whole colour, **Grandee**, born April 11, 1900; s., **Leyland's Champion** (6303); d., **Grand Daughter** (vol. vi. p. 243); s. of d., **Volunteer** (2983):—**Mrs. C. MCINTOSH**, brown, **Carnatie Gem**, born September 15, 1900; s., **Adonis (E.J.H.B.)**; d., **Havering Carnatie**; s. of d., **Montpellier** (5294):—and **H. C. SMITH**, Mount Clare, Roehampton, whole, **Guinea Gold**, born May 21, 1900; s., **Dairy Boy** (6512); d., **Sundew 3rd** (vol. vii. p. 575); s. of d., **Old Port** (3600, &c.).

**C.**—**C. W. ARMITAGE**, Woodlands, Northaw, Potter's Bar, fawn, **Poxy**, born August 28, 1900; s., **Flying Fox** (2729); d., **Farineuse 3rd** (2338); s. of d., **La Chasse Prince** (1927):—**Mrs. C. MCINTOSH**, grey fawn, **Brompton**, born April 2, 1900, bred by **G. Baal**, Jersey; s., **Bessie's Knight** (2518); d., **Berne** (8297):—**Hon. Mrs. MURRAY SMITH**, Gumley Hall, Market Harborough, whole grey, **Reminiscence** (vol. xii.), born June 5, 1900; s., **Recorder** (6380); d., **Stella 2nd** (vol. xi. p. 328); s. of d., **Pampero** (5316):—and **The DUKE OF NORTHUMBERLAND**, Albury Park, Guildford, fawn, **Bovril**, born March 10, 1900, bred by **J. Tulle**, St. Martin's, Jersey; s., **Wellington** (2746); d., **Red Tulip** (2997); s. of d., **Golden Fern's Lad** (2160).

**CLASS 82.—Jersey Cow, in-Milk, calved before 1898. [24 entries.]**

**I. (£15.)**—**C. W. ARMITAGE**, Woodlands, Northaw, Potter's Bar, fawn, **Melvina 3rd**, born February 4, 1894, bred by **J. P. Falle**, Jersey; s., **Lowland King** (4616); d., **Melvina** (2806).

**II. (£10.)**—**Hon. Mrs. MURRAY SMITH**, Gumley Hall, Market Harborough, whole fawn, **Sultana** (vol. ix. p. 299), born April 7, 1895, bred by **Lord Rothschild**, Tring Park, Herts; s., **Spots' Lad** (4389); d., **Regina's Sultana** (vol. vi. p. 505),

**III. (£5.)**—**LADY DE ROTHSCHILD**, Aston Clinton, Tring, whole, **Jolly Brown**, born June 25, 1896, bred by **Mrs. C. Sueur**, Grouville, Jersey; s., **Golden Lad 2nd** (5177); d., **Brown's Beauty** (6325); s. of d., **Morion** (5295).

**R. & V. H. C.**—**The DUKE OF MARLBOROUGH**, Blenheim Palace, Woodstock, whole, **Garantie the 5th**, born March 12, 1896, bred by **Lord Rothschild**, Tring Park, Tring; s., **Spots' Lad**; d., **Garantie the 4th**.

**V. H. C.**—**A. GIBBS**, Tyntesfield, Bristol, whole, **Buttercup 3rd**, born April 23, 1892; s., **Sir Peter** (5394); d., **Buttercup**; s. of d., **Gordon** (5190):—**Mrs. C. MCINTOSH**, Havering Park, Essex, fawn, **Linda**, born March 5, 1897, bred by **G. Baal**, S. Martin's, Jersey; s., **Golden Fern's Lad** (2160); s. of d., **Diplomate 2nd** (3243):—and **Hon. Mrs. MURRAY SMITH**, whole fawn, **La Chasse Camelia** (vol. ix. p. 240), born April 25, 1895, bred by **P. le**

Brocq, La Chasse, Jersey; s., Sir June (5393); d., Amelie (3630, P.S.C.) s. of d., Grantez Lad (3340).

**H. C.**—C. W. ARMITAGE, fawn, **Mignonne**, born February 18, 1894, bred by T. F. Hinault, Jersey; s., Pasha (5319); d., Belle Mignonne (4617):—J. BRUTTON, 7, Princes Street, Yeovil, light brown, **Dulce**, born April 3, 1896, bred by J. J. Maillard, St. Peter's, Jersey; s., Golden Lad (3324); d., Down (H.C., 4068); s. of d., Scotland (3783):—A. GIBBS, whole, **Lass of Jersey 2nd**, born April 18, 1893, bred by J. E. Grandin, St. Owen's, Jersey; s., Courage (5122); d., Lass of Jersey (2811); s. of d., Jupiter (3418):—and Mrs. C. McINTOSH, fawn and white, **Charlotte 6th**, born March 27, 1896, bred by F. E. Luce, St. Peter's, Jersey; s., Sir Visto (2085); d., Charlotte (7478).

**C.**—J. R. CORRETT, More Place, Betchworth, Surrey, dark fawn, **Em**, born March 4, 1892; s., Franciscan (2449); d., Emmie (vol. v. p. 323):—LADY DE ROTHSCHILD, whole, **Longueville Brown 4th**, born January 30, 1896, bred by P. Arthur, Jersey; s., Hope (1948); d., Longueville Brown 2nd (5463); s. of d., Maggie's Boy:—Col. H. McCALMONT, M.P., Bishopswood, Ross, fawn, **Freedom**, born January 30, 1897, bred by W. G. Renouf, St. Martin's, Jersey; s., Golden Fern's Lad (2160); d., Tidy (5949):—and his fawn, **Harmony**, born June 23, 1897, bred by J. M. Bannerman, Bishopswood, Ross; s., Minstrel (5991); d., Monitress; s. of d., Mentor (4632):—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, whole, **Philomene 2nd**, born May 2, 1897, bred by F. le Brocq, St. Owen's, Jersey; s., Aristocrat (J.H.B., 2280); d., Philomene (J.H.B., 5671):—and D. MUTTON, Triangle Jersey Farm, Plumpton, Lewes, Sussex, light fawn, **Lucy 5th**, born August 4, 1893; s., Mango (E.J.H.B., 3506); d., Lucy 4th; s. of d., Shotover (E.J.H.B., 2889).

**CLASS 83.—Jersey Heifer, in-Milk, calved in 1898. [19 entries.]**

**I. (£10).**—LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Carol**, born April 26, 1898; s., Chieftain (5829); d., Harmony (vol. ix. p. 231); s. of d., Spots' Lad (4389).

**II. (£5).**—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmonds, fawn, **Beatrice**, born July 1, 1898; s., Bessemer (6133); d., Golden Streak (vol. x. p. 255; s. of d., Golden Fluke (4557).

**III. (£2).**—The DUKE OF MARLBOROUGH, Blenheim Palace, Woodstock, whole, **Phyllis**, born May 22, 1898, bred by A. C. Amy, Jersey; s., Lustre; d., Sweet Helen.

**R. & V. H. C.**—Mrs. C. McINTOSH, Havering Park, Essex, grey, **Pearl 4th**, born January 12, 1898, bred by C. Le Suer, Grouville, Jersey; s., Golden Fern's Lad (2160); d., Pearl 3rd (6516).

**V. H. C.**—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, broken, **Mabel 42nd**, born January 17, 1898, bred by W. J. Labey, Grouville, Jersey; s., Great Scott (5574); d., Mabel 31st (J.H.B., 5324); s. of d., Boyle (3993):—and Hon. Mrs. MURRAY SMITH, Gumley Hall, Market Harborough, dark fawn, **Christina**, born March 29, 1898, bred by W. Alexander, St. Mary's, Jersey; s., Castor's Pride (2170); d., Suspect 5th (5122); s. of d., Royal Boy (1511).

**H. C.**—EARL CADOGAN, K.G., fawn, **Norah**, born April 17, 1898; s., Nevada (5302); d., Golden Legend (vol. ix. p. 226); s. of d., Golden Fluke (4557):—J. S. EVANS, The Chase, Southwater, Sussex, whole, **Mousy 10th**, born January 24, 1898, bred by A. Le Gallais, St. Brelade, Jersey; s., The Owl (2195); d., Mousy 9th (6017); s. of d., Duc (1751):—

and Col. H. McCALMONT, M.P., Bishopswood, Ross, fawn, **Pretoria**, born February 6, 1898.

C.—FOWLER and DE LA PERELLE, Southampton, fawn, **Criquette 3rd** (Fol. 114, J.H.B.), born December 31, 1898, bred by D. Bisson, Jersey; s., **Golden Prince** (2502, J.H.B.); d., **Criquette 2nd** (6027, J.H.B.);—and Col. H. McCALMONT, M.P., fawn, **Toupée**, born May 25, 1898; s., **Distinction's Security** (5523); d., **Wigton 6th**; s. of d., **Flora's Lad** (4098).

**CLASS 84.—Jersey Heifer, calved in 1899. [19 entries.]**

I. (£10).—Mrs. C. McINTOSH, Havering Park, Essex, brown **Little May**, born May 13, 1899, bred by P. Pillot, Jersey; s., **Eminent 2nd** (2532, H.C.); d., **Little Abe** (8491, F.S.).

II. (£5).—Mrs. W. BARRON, Taplow House, Bucks, fawn, **Rosette 5th**, born January 25, 1899; s., **Baron** (5798); d., **Rosette 2nd** (vol. vi. p. 524); s. of d., **Lord of the Isles** (4612).

III. (£2).—A. MILLER-HALLET, Goddington, Chelsfield, Kent, whole, **La Chasse Linda**, born January 6, 1899, bred by P. le Brocq, St. Owen's, Jersey; s., **Clio** (J.H.B. vol. xv. 2620); d., **Becquet's Jubilee 2nd** (J.H.B. 3494); s. of d., **Tip Top** (5419).

R. & V. H. C.—LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Virtue**, born February 5, 1899; s., **Pontonsan's Lad** (6364); d., **Rosebud** (vol. ix. p. 287); s. of d., **Romeo** (4689).

V. H. C.—J. BRUTTON, 7, Princes Street, Yeovil, fawn, **Wild Buttercup**, born April 1, 1899, bred by F. Le Brocq, The Homestead, St. Peter's, Jersey; s., **Duplex** (2586); d., **Lady**; s. of d., **Maitland** (6566):—A. E. McMULLEN, North Road House, Hertford, brown, **Orange Beauty**, born January 8, 1899, bred by F. Gibaut, Jersey; s., **Spring Jack** (2332, J.H.B.); d., **My Allaine 3rd** (5702, J.H.B.).

H. C.—LORD BRAYBROOKE, Audley End, Saffron Walden, whole fawn, **Blackberry**, born June 4, 1899; s., **Dairy Boy** (6512); d., **Sundew 3rd**; s. of d., **Old Port** (3600):—Col. H. McCALMONT, M.P., Bishopswood, Ross, fawn, **Deedemon**, born May 3, 1899; s., **Sultana's Golden Lad** (2609); d., **Lottie**; s. of d., **Golden Fern's Lad** (2160).

C.—FOWLER and DE LA PERELLE, Southampton, brown, **Royal Signal** (Fol. 144, J.H.B.), born April 1, 1899, bred by J. Hamon, Jersey; s., **Picton 2nd** (2632, J.H.B.); d., **Signal** (7610, J.H.B.):—A. MILLER-HALLETT, whole, **Jewel of Asia**, born January 2, 1899, bred by G. W. de Carteret, St. Peter's, Jersey; s., **Nizam** (J.H.B. vol. xiv. 2408); d., **Delicata** (J.H.B. 5375); s. of d., **Golden Lad** (3324):—and His Grace the DUKE OF NORTHUMBERLAND, K.G., Albury Park, Guildford, Surrey, **Boulogne 2nd**, born March 10, 1899, bred by C. F. Gruchy, Trinity, Jersey; s., **White Star** (2353); d., **Boulogne** (5797); s. of d., **Fontaine's Boy**.

**CLASS 85.—Jersey Heifer, calved in 1900. [48 entries.]**

I. (£10).—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmunds, black fawn, **Sunbeam**, born March 15, 1900; s., **Blucher** (6141); d., **Golden Streak** (vol. x. p. 255); s. of d., **Golden Fluke** (4557).

II. (£5).—Mrs. C. McINTOSH, Havering Park, Essex, fawn, **Havering Gloriosa 2nd**, born April 14, 1900; s., **Havering Pride**; d., **Gloriosa 3rd**; s. of d., **Silver Grey** (1805).

III. (£2).—Mrs. C. McINTOSH, fawn, **Zenobia 48th**, born April 1, 1900; s., **Havering Glory**; d., **Zenobia 35th**; s. of d., **Peeping Tom**.

**R. & V. H. C.**—Col. H. McCALMONT, M.P., Bishopswood, Ross, whole, **Bravura**, born June 10, 1900; s., **Bravado**; d., Wigton 6th; s. of d., **Flora's Lad** (4098).

**V. H. C.**—J. R. CORBETT, More Place, Betchworth, Surrey, grey fawn, **Stella**, born October 9, 1900; s., **Artisan** (I.H.B., vol. xv. 2648, P.S.C.); d., **Starbright** 4th; s. of d., **Harry** 4th (5924).—Mrs. C. M. PERKINS, Oak Dene, Holmwood, Surrey, brown, **Six Rues Baulk**, born July 20, 1900; s., **Spot Stroke**; d., **Six Rues Boast**; s. of d., **Fame's Duke** (5161).—P. PHIPPS, Rushton Hall, Kettering, broken, **Brownny 3rd**, born June 16, 1900; s., **Gipsy Premier** (6229); d., **Brownny 2nd** (vol. x. p. 213); s. of d., **La Commune's Prince** (2198).—and H. C. SMITH, Mount Clare, Roehampton, Surrey, whole, **Barcarolle**, born May 7, 1900; s., **Barker** (6163); d., **Lemon Queen 2nd** (vol. vi. p. 331); s. of d., **Old Port** (3600, &c.).

**H. C.**—C. W. ARMITAGE, Woodlands, Nor.haw, Potters' Bar, dark fawn, **Marchioness**, born April 14, 1900; s., **Marquis** (6326); d., **Renée** (vol. x. p. 321).—Mrs. W. BARRON, Taplow House, Bucks, grey, **Lady of the Lake 10th**, born May 3rd, 1900; s., **Fearless** (6548); d., **Lady of the Lake 5th** (vol. vi. p. 322); s. of d., **Viola's Pride**.—Col. H. McCALMONT, M.P., fawn, **Salute**, born April 14, 1900; s., **Bravado**; d., **Welcome**; s. of d., **Ida's Prince**.—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, whole, **Jersey Baby**, born May 1, 1900, bred by J. Messury, Trinity, Jersey; s., **Colonist** (J.H.B., 2185); d., **Resida** (J.H.B., 7289).—and Mrs. C. M. PERKINS, grey, **Toque**, born June 22, 1900; s., **Grey Duke** (5576); d., **Trousseau**; s. of d., **Baron Wolseley** (2227).

**C.**—Admiral Hon. T. S. BRAND, Glynde Place, Lewes, Sussex, whole, **Rosebud**, born June 9, 1900; s., **Stars Hero**; d., **Susan**; s. of d., **Nimrod**.—LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Damsel**, born February 11, 1900; s., **Rattler** (6030); d., **Dame Durden** (vol. vi. p. 146); s. of d., **Voicks** (4455).—A. GIBBS, Tyntesfield, Bristol, whole, **Faith**, born May 11, 1900; s., **Black Prince** (6137); d., **Matilda 2nd**; s. of d., **Skip Jack** (5397).—and his whole, **Charity**, born August 24, 1900; s., **Black Prince** (6137); d., **Alice 4th**; s. of d., **Monte Carlo of Wells** (4945).—A. MILLER-HALLETT, broken, **Mint**, born April 30, 1900, bred by Lord Rothschild, Tring; s., **Butter Test**; d., **Maud** (vol. vi. p. 388); s. of d., **Beau Gustave** (3066).—and Mrs. C. M. PERKINS, fawn, **Miss Gumley**, born May 4, 1900; s., **Hamley** (6585); d., **Miss Garfield**; s. of d., **Dr. Jim** (2318).

*Special Prize given by Sir James Blyth, Bart.—The Blythwood Challenge Silver Bowl, weighing 25 ounces, for the Best Cow or Heifer, in-Milk, in any of the Jersey Classes, bred in Great Britain or Ireland, to be awarded by inspection [21 entries] (see Special Condition 61 in Prize Schedule).*

**I.** LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Carol**, born April 26, 1898; s., **Chieftain** (5829); d., **Harmony** (vol. ix. p. 231); s. of d., **Spots' Lad** (4389).

**R.** The DUKE OF MARLBOROUGH, Blenheim Palace, Woodstock, whole, **Garantie the 5th**, born March 12, 1896, bred by Lord Rothschild, Tring Park, Tring; s., **Spots' Lad**; d., **Garantie the 4th**.

**GUERNSEY.****CLASS 86.—Guernsey Bull, calved in 1897\*or 1898. [6 entries.]**

**I. (£10.)**—J. C. FORSTER, Clatford Mills, Andover, red and white, **Captain Lyons** (1188, E.G.H.B.), born April 9, 1898, bred by A. Brehaut, Pages, St. Martin's; s., Squire of the Houards (1038, P.S.); d., Flenric 6th (3895, P.S.).

**II. (£5.)**—H. F. PLUMPTRE, Goodnestone, near Dover, red, **Redpath** (1242), born September 4, 1898, bred by P. Martell, La Masse, Castel, Guernsey; s., Smilax (1041, P.S., R.G.A.S.); d., May Rose 7th (3996, P.S., R.G.A.S.).

**III. (£2.)**—E. A. HAMBRO, Hayes Place, Kent, fawn, **Trouper**, born August 10, 1898, bred by J. Douce, St. Martin's, Guernsey; s., Free Boy; d., Beauty of Donit Farm.

**B. & H. C.**—Mrs. MONTEFIORE, Worth Park, Crawley, fawn and white, **Lord Bobs** (1315), born June 10, 1898, bred by J. De Garis, Castel, Guernsey; s., His Majesty (952, P.S., R.G.A.S.); d., Little Floe 6th (4336, P.S., R.G.A.S.).

**C.**—Col. H. W. SHAKERLEY, Burgate, Godalming, fawn, **Captain Parry** (971), born January 12, 1897, bred by A. Brehaut, Pages, St. Martin's, Guernsey; s., Captain Lyons 1st (1061, P.S., R.G.A.S.); d., Petite 5th (3945, P.S., R.G.A.S.).

**CLASS 87.—Guernsey Bull, calved in 1899. [12 entries.]**

**I. (£15.)**—W. A. GLYNN, Seagrove, Sea View, Isle of Wight, orange, fawn and white, **Rowland of Seaview 2nd**, born June 20, 1899; s., Hopeful 7th (780); d., Malena des Tolets 2nd (3097).

**II. (£10.)**—LADY TICHBORNE, Tichborne Park, Alresford, Hants, fawn and white, **Golden Rule** (1290, E.G.H.B.), born August 18, 1899, bred by H. M. Ozanne, Lilyvale, Castel; s., Massachusetts (293, F.S., R.G.A.S.); d., Rose of Gold (3668, P.S., R.G.A.S.).

**III. (£5.)**—E. A. HAMBRO, Hayes Place, Kent, fawn and white, **Hayes Prince**, born November 1, 1899; s., Cobo Prince; d., Silver Spade.

**R.**—Mrs. MONTEFIORE, Worth Park, Crawley, fawn and white, born January 14, 1899; s., Safe Guard of the Capelles (318); d., Daisy of the Capelles.

**H. C.**—F. HARGREAVES, Merton Grange, Gamlingay, sandy, fawn and white, **Kimberley** (1311), born March 5, 1899, bred by H. M. Ozanne, Lilyvale, Castel, Guernsey; s., Massachusetts (293, F.S., R.G.A.S.); d., Surahbi (4656); s. of d., Cogent (756, P.S., R.G.A.S.):—and Sir H. F. LENNARD, Bart., Wickham Court, West Wickham, Kent, red and white, **Lord Austin**, born September 29, 1899; s., Hope of Down Hill (1104, E.G.H.B.); d., Lady 65 (3419, E.G.H.B.); s. of d., Claude (298, E.G.H.B.).

**C.**—W. A. GLYNN, orange, fawn and white, **Billy 8th** (1187, E.G.H.B.), born May 1, 1899; s., Frolic 6th (899, E.G.H.B.); d., Seaview Rose (3921):—and H. F. PLUMPTRE, Goodnestone, near Dover, fawn and white, **Suzerain** (1252), born July 1, 1899, bred by the late J. Stephens, Grove House, Finchley; s., May Day (1132); d., Claremont Madelaine (3300); s. of d., Young Traveller (956, P.S., R.G.A.S.).

**CLASS 88.—Guernsey Bull, calved in 1900. [14 entries.]**

**I. (£12).**—**LADY TICHBORNE**, Tichborne Park, Alresford, Hants, red and white, **Itchen Masher** (1308, E.G.H.B.), born February 27, 1900, bred by J. Martel, Haut Pavé, Castel; s., Rydale 7th (1112, P.S., R.G.A.S.); d., Beauty of the Haut Pavé (4025, P.S., R.G.A.S.).

**II. (£5).**—**Sir H. F. LENNARD**, Bart., Wickham Court, Kent, red and white, **Wickham Boy**, born June 17, 1900, bred by W. Le Page, Villocq, Castel, Guernsey; s., Smilax 1st (1167, P.S., R.G.A.S.); d., Wickham Daisy (5028, E.G.H.B.); s. of d., Smilax 2nd (1041, P.S., R.G.A.S.).

**III. (£2).**—**LADY TICHBORNE**, red and white, **Rival** (1343, E.G.H.B.), born April 5, 1900, bred by J. C. Forster, Clatford Mills, Andover; s., Rival of Mont Marché (1164, P.S., R.G.A.S.); d., Clatford Gentle (4746).

**R. & V. H. C.**—**The EARL OF ASHBURNHAM**, Ashburnham Place, Ashburnham, Battle, Sussex, lemon, fawn and white, **Mirth**, born January 13, 1900; s., Harlequin (996); d., Lady Myrtle.

**H. C.**—**J. C. FORSTER**, Clatford Mills, Andover, red and white, **Captain Lyons 2nd** (1271, E.G.H.B.), born February 16, 1900; s., Captain Lyons (1188, E.G.H.B.); d., Clatford Spot 2nd (2112, E.G.H.B.):—**W. A. GLYNN**, Seagrove, Sea View, Isle of Wight, orange, fawn and white, **Frolic 12th** (1287, E.G.H.B.), born June 21, 1900; s., Frolic 6th (899, E.G.H.B.); d., Seaview Rose (3921):—and **Mrs. MONTEFIORE**, Worth Park, Crawley, fawn and white, **Signalman 5th** (1349), born July 3, 1900; s., Signalman 2nd (1048); d., Rose of Sharon (4273).

**C.**—**J. D. T. PARSONS, Jun.**, Ashurst Place, Langton, Tunbridge Wells, fawn and white, **Cosmoramic** (1278), born May 24, 1900, bred by G. Long, Ogbourne, Marlborough; s., Nomadic (1236); d., Republica 6th (1163); s. of d., Golden Fleece (214, P.S.):—**H. F. PLUMPTRE**, Goodnestone, near Dover, fawn and white, **May Morn** (1322), born May 1, 1900; s., Randolph (1152); d., Muriel 6th (2765); s. of d., Express (609):—and **A. H. WINGFIELD**, Ampthill House, Ampthill, Bedfordshire, red and white, **Lord Alwynne** (1314, E.G.H.B.), born August 27, 1900; s., Nebuchadnezzar (1141, E.G.H.B.); d., Alexandrina 2nd (3220, E.G.H.B.).

**CLASS 89.—Guernsey Cow, in-Milk, calved before 1898. [12 entries.]**

**I. (£15).**—**E. A. HAMBRO**, Hayes Place, Kent, red and white, **Justinee**, born June 4, 1895, bred by A. Billy, Castel, Guernsey; s., Our Paradox; d., Justinee.

**II. (£10).**—**E. A. HAMBRO**, pale red and white, **Charmante of the Gronve**, born July 7, 1896, bred by J. Bourgaize, St. Saviour's, Guernsey; s., His Majesty; d., Charmante 5th.

**III. (£5).**—**H. F. PLUMPTRE**, Goodnestone, near Dover, light red and white, **Muriel 6th** (2765), born December 14, 1894, bred by the late J. Stephens, Grove House, Finchley; s., Express (609); d., Muriel 4th (1984); s. of d., May Boy (346).

**R. & V. H. C.**—**H. F. PLUMPTRE**, fawn and white, **Gulnare 4th** (2690), born February 6th, 1894, bred by Lord Rookwood, Down Hall, Harlow, Essex; s., General Whiteface (473); d., Gulnare 2nd (1312); s. of d., Master Tom 2nd (196).

**H. C.**—**E. A. HAMBRO**, red and white, **Nellie of the Houquette**, born January 1, 1895, bred by N. Robin; s., Winter; d., Nelly of the Houquette:—and **J. D. T. PARSONS, jun.**, Ashurst Place, Langton, Tunbridge

Wells, orange and white, **Lady Langton** (3428), born January 15, 1896; s., **Orange Climax** (716); d., **Rose of Oronoto** (2023); s. of d., **Rydale** (475, P.S.).

**C.—EARL OF ASHBURNHAM**, Ashburnham Place, Ashburnham, Battle, Sussex, **Lady Myrtle** (2715), born November 22, 1894; s., **Acrobat** (524); d., **Lady Evergreen** (1615); s. of d., **Paradox** (352):—Hon. Mrs. A. B. HAMILTON, Burley Lodge, Ringwood, Hants, fawn and white, **Jessie** 11th, born June 30, 1895; s., **Philistine** 2nd (571, E.G.H.B.); d., **Jessie** 8th (1592, E.G.H.B.); s. of d., **Loyalist** (103, E.G.H.B.):—and F. HARGREAVES, Merton Grange, Gamlingay, Sandy, red and white, **Merton Vespasia** (4908), born November 12, 1890, bred by C. Domaille, Villette, St. Martin's, Guernsey; s., **David** (570, P.S., R.G.A.S.); s. of d., **Vespasia** 3rd (1129, P.S., R.G.A.S.).

**CLASS 90.—Guernsey Heifer, in-Milk, calved in 1898. [9 entries.]**

**I. (£10.)—Mrs. MONTEFIORE**, Worth Park, Crawley, fawn and white, **Lilly of the Forest** (4540), born March 29, 1898, bred by W. H. Tibou, St. Peter's Port, Guernsey; s., **Nelson**; d., **Lily**.

**II. (£5.)—LADY TICHBORNE**, Tichborne Park, Alresford, Hants, red and white, **Itchen Beda** (4110), born February 7, 1898, bred by J. W. Martel, Preel, Castel; s., **Loyal of the Hunguets** (978, P.S., R.G.A.S.); d., **Beda** of the Preel (1797, F.S.).

**III. (£2.)—Sir H. F. LENNARD**, Bart., Wickham Court, Kent, pale red and white, **Belle Mahone 5th** (4698, E.G.H.B.), born May 7, 1898, bred by J. le Page, Villocq, Castel, Guernsey; s., **Squire of the Fields** (1005, P.S., R.G.A.S.); d., **Belle Mahone 4th** (3858, P.S.).

**R. & H. C.—LADY TICHBORNE**, fawn, **Itchen Primrose 2nd** (late **Primrose 1st of Les Caches**) (4141, P.S., R.G.A.S.), born July 19, 1898, bred by T. M. Simon, Les Caches, St. Saviour's; s., **His Majesty** (952, P.S., R.G.A.S.); d., **Primrose of Offspring 2nd** (2578, P.S., R.G.A.S.).

**H. C.—E. A. HAMBRO**, Hayes Place, Kent, pale red, **Hayes Richesse**, born May 1, 1898; s., **His Majesty**; d., **Richesse du Chene**:—and A. H. WINGFIELD, Ampthill House, Ampthill, Beds, red, **Daisy of St. Peter's** (4411, E.G.H.B.), born August 4, 1898, bred by T. Allen, Les Paysaus, St. Peter's; s., **Improvement**; d., **Daisy**.

**CLASS 91.—Guernsey Heifer, calved in 1899. [7 entries.]**

**I. (£10.)—LADY TICHBORNE**, Tichborne Park, Alresford, Hants, red and white, **Itchen Primrose**, late **Primrose des Sages** (6315, G.H.B.), born February 7, 1899, bred by Mrs. Le Messurier, Sages, St. Peter-in-the-Wood; s., **Frances Jewel** 2nd; d., **Polly**.

**II. (£5.)—W. A. GLYNN**, Seagrove, Sea View, Isle of Wight, orange, fawn and white, **Phyllis 3rd**, born June 2nd, 1899; s., **Hopeful** 7th; d., **Phyllis**.

**III. (£2.)—E. A. HAMBRO**, Hayes Place, Kent, fawn and white, **Claremont Jasmine 2nd**, born March 24, 1899, bred by W. H. Fowler, Claremont, Taunton; s., **Claremont Westward Ho!**; d., **Claremont Jasmine**.

**R. & H. C.—E. A. HAMBRO**, fawn and white, **Hayes Lily**, born April 25, 1899; s., **Ovo**; d., **Lily of the Bas Sejour**.

**H. C.—FOWLER and DE LA PERELLE**, Southampton, red and white, **Gladys 2nd** (6331, G.H.B.), born January, 1899, bred by C. Halliday,

Guernsey :—and J. D. T. PARSONS, jun., Ashurst Place, Langton, Tunbridge Wells, lemon and white, **Felicia 5th** (4435, born July 7, 1899, bred by Major Fraser, Bryon Hall, Worthing; s., Chesswood Baronet (874); d., Felicia (2973).

C.—Col. H. W. SHAKERLEY, Burgate, Godalming, light fawn, **Georgie** (4445), born October 31, 1899; s., Captain Parry (971); d., Lady Alda 2nd (3789).

**CLASS 92.—Guernsey Heifer, calved in 1900. [18 entries.]**

I. (£10).—E. A. HAMBR, Hayes Place, Kent, fawn and white, **Claremont Hyacinth 2nd**, born April 28, 1900, bred by W. H. Fowler, Claremont, Taunton; s., Klondyke; d., Claremont Hyacinth.

II. (£5).—Mrs. MONTEFIORE, Worth Park, Crawley, fawn and white, **Claremont Flora 4th** (4739), born May 18; s., Signalman 2nd (1048); d., Claremont Flora (3288).

III. (£2).—Col. H. W. SHAKERLEY, Burgate, Godalming, Surrey, fawn, **Marie des Presvost** (B.H.S.), born May 28, 1900; s., Captain Parry (971); d., Polly des Presvost 2nd (4245); s. of d., His Majesty (952, P.S., R.G.A.S.).

R. & V. H. C.—Hon. Mrs. A. B. HAMILTON, Burley Lodge, Ringwood, Hants, fawn, little white, **Rosemary 4th**, born June 8th, 1900; s., His Royal Majesty (1106, E.G.H.B.); d., Rosemary 2nd (2304, E.G.H.B.); s. of d., Serapis (364, E.G.H.B.).

H. C.—J. C. FORSTER, Clatford Mills, Andover, red and white, **Antona 10th** (4691, E.G.H.B.), born May 28th, 1900; s., Captain Lyons (1188, E.G.H.B.); d., Antona 5th (2851, E.G.H.B.):—J. P. MORGAN, Dover House, Roehampton, Surrey, red and white, **Mobile**, born July 2, 1900; s., Challenger; d., Mobile 1st (1994, F.S.); s. of d., Uncle Peter (1021, P.S.):—and H. F. PLUMPTRE, Goodnestone, near Dover, red and white, **Gulnare 13th** (4810), born February 19, 1900; s., Randolph (1152); d., Gulnare 4th (2690); s. of d., General Whiteface (473).

C.—W. A. GLYNN, Seagrove, Sea View, Isle of Wight, orange, fawn and white, **Hettie 4th**, born June 15, 1900; s., Frolic 6th (899, E.G.H.B.); d., Hettie (4100, E.G.H.B.):—and LADY TICHBORNE, Tichborne Park, Alresford, Hants, orange and fawn, **Royal Rose 2nd** (4979, E.G.H.B.), born June 4, 1900; s., Itchen Jewel (1112); d., Royal Rose (4279).

**KERRY.**

**CLASS 93.—Kerry Bull, calved in 1898, 1899, or 1900. [5 entries.]**

I. (£7).—C. J. CORY, J.P., Llantarnam Abbey, Monmouthshire, **Llantarnam Lord**, born February 19, 1900; s., Abbeyleix Waterville Knight (368, R.D.S.); d., Abbeyleix Lady Clancarty (2334, R.D.S.); s. of d., Scarriff (310, R.D.S.).

II. (£5).—The DUCHESS OF NEWCASTLE, Clumber, Worksop, **Hardwick Prince**, born September 6, 1899; s., Swell; d., Shamrock (1180).

R. & H. C.—J. THORLEY, Ringdale House, Faringdon, Berks, **Gilderoy**, born April 23, 1900, bred by C. B. Marley, Ireland; s., Cormac (407); d., Annie 3rd (2346).

C.—The DUCHESS OF NEWCASTLE, **Hardwick Duke**, born September 7, 1899; s., Swell; d., Bounce (1509).

**CLASS 94.—Kerry Cow or Heifer, in-Milk, calved in or before 1898.**  
[6 entries.]

**I. (£7) and Champion (£5 5s.).\***—J. THORLEY, Ringdale House, Faringdon, Berks, **Grenagh Laura** (H.B., 2356), born 1895.

**II. (£5) and R. for Champion.\***—The DUCHESS OF NEWCASTLE, Clumber, Worksop, **Hardwick Nancy**, born May 20, 1897; s., Kidmore Floral King (294); d., **Shamrock** (1180).

**III. (£2).**—The DUCHESS OF NEWCASTLE, **La Mancha Laurel** (2562), born 1897.

**R. & H. C.**—C. J. CORY, J.P., Llantarnam Abbey, Monmouthshire, **Abbeyleix Lady Clancarty** (2334, R.D.S.), born February 20, 1897, bred by Lord de Vesci, Abbeyleix, Ireland; s., Scariff (310, R.D.S.); d., Lady Castletown 3rd (1248, R.D.S.); s. of d., Gort Admiral (140, R.D.S.).

**C.**—C. J. CORY, J.P., **Abbeyleix Norah 5th** (2336, R.D.S.), born March 26, 1897, bred by Lord de Vesci, Abbeyleix, Ireland; s., King Conn (296, R.D.S.); d., **Norah 4th** (699, R.D.S.); s. of d., **Feale** (8, R.D.S.) :—and J. THORLEY, **La Mancha Vesta** (128, H.B.), born 1894.

**CLASS 95.—Kerry Heifer, calved in 1899 or 1900.** [3 entries.]

**I. (£7).**—J. THORLEY, Ringdale House, Faringdon, Berks, **La Mancha Playful**, born April 3, 1899, bred by Robertson and Sons, Babraham, Cambridge.

**DEXTER KERRY.**

**CLASS 96.—Dexter Kerry Bull, calved in 1898, 1899, or 1900.**  
[8 entries.]

**I. (£7) and R. for Champion.†**—Lieut.-Gen. Hon. S. J. GOUGH-CALTHORPE, Perry Hall, Perry Barr, Birmingham, red, **Tod Sloan** (31), born 1898, bred by Robertson and Sons, Church Farm, Babraham, Cambridge.

**II. (£5).**—W. STALLARD, Sunny Lodge, Malvern Link, black, **Malvern Signor**, born February 15, 1899; s., Redmarley (91); d., **Malvern Signorina** (981); s. of d., Honeybourne (135).

**III. (£2).**—Mrs. E. A. LEATHAM, Hinton House, Brackley, black, **La Mancha Dick**, born April 10, 1899, bred by Robertson and Sons, Church Farm, Babraham, Cambridge; s., Brick Bat; d., Wee Bantry.

**R. & V. H. C.**—Mrs. J. PAISLEY, Waresley, Sandy, Beds, black, **La Mancha C.I.V.**, born 1899.

**H. C.**—B. DE BEETODAKO, Cowbridge House, Malmesbury, Wilts, red, **La Mancha Good Lad**, born March, 1899.

**C.**—H. M. GIBBS, Barrow Court, Flax Bourton, Somerset, black, **Barrow Duke**, born 1899, bred by — Fletcher, Wimborne, Dorset.

\* Given by the English Kerry and Dexter Cattle Society, for the Best Animal in Class 93, 94, or 95.

† Given by the English Kerry and Dexter Cattle Society, for the Best Animal in Class 96, 97, or 98.

**CLASS 97.—Dexter Kerry Cow or Heifer, in-Milk, calved in or before 1898. [8 entries.]**

**I. (£7)** and **Champion (£5 5s.).\***—**B. DE BERTODANO**, Cowbridge House, Malmesbury, black, **Upminster Dainty Dish**, born 1897.

**II. (£5).**—**B. DE BERTODANO**, black, **La Mancha Nest Egg**, born March, 1898, bred by W. Kent, Co. Kerry, Ireland.

**III. (£2).**—**Mrs. J. PAISLEY**, Waresley, Sandy, Beds, red, **Upminster Redakin**, born 1898.

**R. & H. C.**—**COUNTESS DE LA WARR**, The Manor House, Bexhill-on-Sea, black, **Upminster Black Rose** (396), born May 13, 1898, bred by E. S. Woodiwiss, Upminster; s., **La Mancha Tom Thumb** (81); d., **Red Rose** (234).

**C.**—**H. M. GIBBS**, Barrow Court, Flax Bourton, Somerset, black, **Barrow Agnes**, born 1898; s., **Barrow Prince**; d., **Barrow Queen**:—and his black, **Irish Ivy**, born 1898, bred by Robertson and Sons, Babraham, Cambridge:—and his black, **Barrow Beauty**, born 1898; s., **Barrow Prince**; d., **Barrow Duchess**:—and **COUNTESS DE LA WARR**, red, **Rosemary** (418), born 1898.

**CLASS 98.—Dexter Kerry Heifer, calved in 1899 or 1900. [6 entries.]**

**I. (£7).**—**Mrs. J. PAISLEY**, Waresley, Sandy, Beds, red, **La Mancha Modest Girl**, born 1899.

**II. (£5).**—**Lieut.-Gen. Hon. S. J. GOUGH-CALTHORPE**, Perry Hall, Perry Barr, Birmingham, red, **Sweetheart** (552), born 1899, bred by R. T. Robertson, Church Farm, Babraham, Cambridge.

**III. (£2).**—**Lieut.-Gen. Hon. S. J. GOUGH-CALTHORPE**, **Didn't Know**, born 1899, bred by R. T. Robertson, Church Farm, Babraham, Cambridge.

**R. & V. H. C.**—**W. STALLARD**, Sunny Lodge, Malvern Link, black, **Malvern Smirk**, born July 15, 1899; s., **Malvern Chasseur**; d., **Malvern Smile**; s. of d., **King of the Roses** (168).

**H. C.**—**B. DE BERTODANO**, Cowbridge House, Malmesbury, black, **La Mancha Weeny**, born April, 1899.

**C.**—**H. M. GIBBS**, Barrow Court, Flax Bourton, Somerset, black, **Barrow Nest Egg**, born March 14, 1900, bred by Robertson and Sons, Babraham, Cambridge; s., **Professor**; d., **La Mancha Nest Egg**.

**DAIRY.**

**CLASS 99.—Cow, in-Milk, of any breed or cross, under 900 lbs. live weight, yielding the largest quantity of milk, of normal character, containing, on the average of the two competitive milkings, 12 per cent. of total solids, of which not less than 8.25 per cent. shall be fat, the period of lactation being taken into consideration.**

**I. (£10).**—**Dr. H. WATNEY**, Buckhold, Pangbourne, fawn Jersey, **Sharab**, born December 16, 1896; s., **Squib's Lad** (5732); d., **Sherbert 2nd**.

**II. (£3).**—**Hon. Mrs. MURRAY SMITH**, Gumley Hall, Market Harborough, whole fawn Jersey, **Lorna** (vol. vi. p. 340), born February 26, 1893, bred

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\* Given by the English Kerry and Dexter Cattle Society for Best Animal in Class 96, 97, or 98.

by Miss Standish, Marwell Manor, Eastleigh, Hants; s., **Manfant's Legacy** (3528); d., Lillian; s. of d., Bumper (2289).

**III. (£2).**—Dr. H. WATNEY, fawn Jersey, **Syndic's Thorn 2nd**, born January 1, 1897; s., Syndic (6082); d., Wild Thorn 2nd; s. of d., Lord of the Sunny Isles.

**CLASS 100.**—*Cow, in-Milk, of any breed or cross, 900 lbs. live weight or over, yielding the largest quantity of milk, of normal character, containing, on the average of the two competitive milkings, 12 per cent. of total solids, of which not less than 3·25 per cent. shall be fat, the period of lactation being taken into consideration.*

**I. (£10).**—J. EVENS, Burton, near Lincoln, Lincoln red Shorthorn, about 6 years old.

**II. (£3).**—J. INNES, J.P., Morden Hall Farm, Morden, red and a little white Shorthorn.

**III. (£2).**—LORD BRAYBROOKE, Audley End, Saffron Walden, whole light fawn Jersey, **Dewberry**, born November 5, 1895; s., Ethel's King George (4832); d., Sundew 3rd; s. of d., Old Port (3600).

#### **BUTTER TEST.**

(The Prizes in Classes 101 and 102 were given by the English Jersey Cattle Society, and Entries in them were subject to any conditions issued by that Society previous to the Tests.)

**CLASS 101.**—*Cow, of any breed or cross, under 900 lbs. live weight, obtaining the greatest number of points by the practical test of the Separator and Churn, judged by the scale of points adopted by the English Jersey Cattle Society.*

**I. (£10) and Gold Medal.\***—Dr. H. WATNEY, Buckhold, Pangbourne, fawn Jersey, **Sharab**, born December 16, 1896; s., Squib's Lad (5732); d., Sherbet 2nd.

**II. (£3) and Bronze Medal.\***—Dr. H. WATNEY, fawn Jersey, **Syndic's Thorn 2nd**, born January 1, 1897; s., Syndic (6082); d., Wild Thorn 2nd; s. of d., Lord of the Sunny Isles.

**III. (£2) and Special (£1).†**—J. R. CORBETT, More Place, Betchworth, Surrey, dark fawn, **Emm**, born March 4, 1892; s., Franciscan (2449); d., Emmie (vol. v. p. 323).

**Certificate of Merit.**—C. W. ARMITAGE, Woodlands, Northaw, Potter's Bar, fawn, **Mignonne**, born February 18, 1894, bred by T. F. Hinault, Jersey; s., Pasha (5319); d., Belle Mignonne (4617):—J. BRUTTON, 7, Princes Street, Yeovil, light brown, **Dulce**, born April 3, 1896, bred by J. J. Maillard, St. Peter's, Jersey; s., Golden Lad (3324); d., Down (4068,

\* Gold, Silver, and Bronze Medals were given for the three Jersey Cows, entered or eligible for entry in the English Jersey Herd Book, obtaining the greatest number of points in the test.

† Given for the Best quality of Butter produced by any Jersey Cow awarded a Medal, Prize, or Certificate of Merit in Class 101 or 102.

H.C.); s. of d., Scotland (3783):—J. SPENCER EVANS, The Chase, Southwater, Sussex, fawn, **Oakland's Rosette** (7853), born March 2, 1897, bred by J. A. Perrée, Oaklands, St. Saviour's, Jersey; s., Queenie's Prince (2281); d., Angela's Rosette 5th (5070); s. of d., Birthright (1313):—A. GIBBS, Tyntesfield, Bristol, whole, **Buttercup 3rd**, born April 23, 1892; s., Sir Peter (5394); d., Buttercup; s. of d., Gordon (5190):—Col. H. McCALMONT, M.P., Bishopswood, Ross, fawn, **Freedom**, born January 30, 1897, bred by W. G. Renouf, St. Martin's, Jersey; s., Golden Fern's Lad (2160); d., Tidy (5949):—and his grey, **Lady Brighton**, born October 27, 1897, bred by J. Amy, St. Martin's, Jersey; s., Golden Fern's Lad (2160); d., Old Maid (4926):—D. MUTTON, Triangle Jersey Farm, Plumpton, Lewes, Sussex, fawn, **Lemon**, born August 26, 1895; s., Rosy Boy (4993, E.J.H.B.); d., Joan 4th; s. of d., St. Gatien (2875, E.J.H.B.):—J. SPENCER EVANS, whole, **Mousy 10th**, born January 24, 1898, bred by A. Le Gallais, St. Brelade, Jersey; s., The Owl (2195); d., Mousy 9th (6017); s. of d., Duc (1751):—VISCOUNT ENFIELD, Dancer's Hill, South Mymms, Middlesex, whole Jersey, **Gloaming 4th**, born November 5, 1893, bred by Mrs. Brooke Smith, Bristol; s., Frivolous (4546); d., Gloaming (vol. v. p. 368); s. of d., Phœbus (1881):—Hon. Mrs. MURREAY SMITH, Gumley Hall, Market Harborough, whole fawn Jersey, **Lorna** (vol. vi. p. 340), born February 26, 1893, bred by Miss Standish, Marwell Manor, Eastleigh, Hants; s., Manfant's Lescacy (3528); d., Lilian; s. of d., Bumper (2289):—W. B. RODERICK, Fronheulog, Llanelly, fawn Jersey, **Genteel 2nd**, born June 2, 1893, bred by C. J. Starck, St. Saviour's, Jersey; s., Carno 2nd (5107); d., Genteel; s. of d., Count Cicero (1478):—J. SPENCER EVANS, fawn Jersey, **Ino of Oaklands**, born February 27, 1898, bred by J. A. Perrée; s., Golden Fern's Lad (2160); d., Angela's Rosette 5th (5070); s. of d., Birthright (1313):—W. B. RODERICK, fawn Jersey, **Granville Lily 2nd**, born May 29, 1887, bred by Jules Manoury, St. Saviour's, Jersey; s., Sans Peur 5th (3776); d., Granville Lily; s. of d., Nestor (1850):—and Dr. H. WATNEY, fawn Jersey, **Lady Sherbet 2nd**, born December 25, 1897; s., Lord of the Sunny Isles (4243); d., Sherbet 2nd; s. of d., Sugar Maple.

**CLASS 102.**—*Cow, of any breed or cross, 900 lbs. live weight and over, obtaining the greatest number of points by the practical test of the Separator and Churn, judged by the scale of points adopted by the English Jersey Cattle Society.*

*Certificates of Merit awarded for Jersey Cows, not being prize winners, eligible for the Herd Book, obtaining points as follows:—*

*Under 5 years old, 28 points; 5 years old and over, 32 points.*

**I (£10) and Silver Medal.\***—Dr. H. WATNEY, Buckhold, Pangbourne, grey Jersey, **Red Maple**, born July 14, 1896; s., Savoy (5720); d., Golden Maple (vol. vi. p. 377); s. of d., Egyptian (4535).

**II (£3).**—LORD BRAYBROOKE, Audley End, Saffron Walden, whole light fawn Jersey, **Dewberry**, born November 5, 1895; s., Ethel's King George (4832); d., Sundew 3rd; s. of d., Old Port (3600).

**III (£2).**—Dr. H. WATNEY, fawn Jersey, **Lavanja**, born May 5, 1891; s., The Bard (2212); d., Orange; s. of d., Lord Somers (507).

\* Gold, Silver, and Bronze Medals were given for the three Jersey Cows, entered or eligible for entry in the English Jersey Herd Book, obtaining the greatest number of points in the test.

**Certificate of Merit.**—D. MUTTON, Triangle Jersey Farm, Plumpton, Lewes, Sussex, light fawn, **Lucy 5th**, born August 4, 1893; s., Mango (3506, E.J.H.B.); d., Lucy 4th; s. of d., Shotover (2889, E.J.H.B.):—VISCOUNT ENFIELD, Dancer's Hill, South Myma, Middlesex, white Jersey, **Musk**, born June 4, 1895, bred by C. and M. Palmer, Leighton Buzzard; s., Bream (5089); d., Myrtle (vol. vi. p. 377); s. of d., Romp (2845):—and Dr. H. WATNEY, fawn Jersey, **Shrub**, born October 7, 1896; s., Savoy (5720); d., Syrup (vol. vi. p. 548); s. of d., Lord of the Sunny Isles (4243).

**CLASS 103.**—*English-bred Guernsey Cow or Heifer, entered in the English Guernsey Cattle Society's Herd Book, or eligible for entry therein, obtaining the greatest number of points by the practical Test of the Churn, the points to be reckoned on the weight of Butter and an allowance for lactation to be made under the scale settled by the English Guernsey Society.* [8 entries.]

(The Prizes in Class 103 were given by the English Guernsey Cattle Society.)

**I.** (Silver Cup.)—H. F. PLUMPTRE, Goodnestone, near Dover, light red and white, **Muriel 6th** (2765), born December 14, 1894, bred by the late J. Stephens, Grove House, Finchley; s., Express (609); d., Muriel 4th (1984); s. of d., May Boy (346).

**II.** (Silver Medal and £1.)—J. D. TOOGOOD-PARSONS, jun., Ashurst Place, Langton, Tunbridge Wells, orange and white, **Lady Langton** (3428), born January 15, 1896; s., Orange Climax (716); d., Rose of Orono (2023); s. of d., Rydale (P.S., 475).

**III.** (Bronze Medal and £1.)—H. F. PLUMPTRE, fawn and white, **Gulnare 4th** (2690), born February 6, 1894, bred by Lord Rookwood, Down Hall, Harlow, Essex; s., General Whiteface (473); d., Gulnare 2nd (1312); s. of d., Master Tom 2nd (196).

### LOCAL DAIRY CLASS.

(Prizes given for Competition to Members of the Croydon and Districts Cowkeepers' and Dairyemen's Association for the Best Milch Cow.)

*First Prize, presented by His Worship the Mayor (N. Page, Esq.), Cup or piece of Plate value Five Guineas, with Two Guineas added money.—Second Prize, presented by E. G. Bates, Esq., Cup or piece of Plate value Five Guineas.—Third Prize, presented by Councillor Lillico, Cup or piece of Plate value Three Guineas.—Fourth Prize, presented by Stanley Docking, Esq., Cup or piece of Plate value Two Guineas.*

**I.**—J. T. FRENCH, Crystal Palace Dairy, Gipsy Hill, Norwood.

**II.**—J. T. FRENCH.

**III.**—F. CHAPPELL, Surrey Dairy, Purley.

**IV.**—J. T. FRENCH.

[CLASS HIGHLY COMMENDED.]

*Prizes awarded to Cotswold and Devon Long-Woolled Sheep.* xliii

(The following Prizes were also given in this Class for the Cow yielding the largest amount of Milk.)

*First Prize, presented by the Croydon and Districts Cowkeepers' and Dairymen's Association, Cup or piece of Plate value Three Guineas.—Second Prize, presented by the Croydon and Districts Cowkeepers' and Dairymen's Association, Cup or piece of Plate value Two Guineas.—Third Prize, presented by Councillor Carpenter, Cup or piece of Plate value One Guinea.*

**I.—J. T. FRENCH**, Crystal Palace Dairy, Gipsy Hill, Norwood.

**II.—CURTIS BROS.**, Streatham Dairy Farm, Yalley Road, Streatham.

**III.—F. HELLINGS**, Brighton Road House, Croydon.

**IV.—BAILEY BROS.**, 75, Sussex Road, Croydon.

**R. & V. H. C.—J. H. HEAVER**, Selhurst Farm, South Norwood.

[CLASS HIGHLY COMMENDED.]

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## SHEEP.

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### COTSWOLD.

**CLASS 104.—Cotswold Shearling Ram.** [5 entries.]

**I. (£10.)—W. HOULTON**, Broadfield Farm, Northleach, R.S.O., born January, 1900.

**II. (£5.)—W. HOULTON**, born January, 1900.

**R.—R. SWANWICK**, Royal Agricultural College Farm, Cirencester, born after January 1, 1900.

**CLASS 105.—Pair of Cotswold Ram Lambs, dropped in 1901.**  
[2 entries.]

**I. (£10.)—R. SWANWICK**, Royal Agricultural College Farm, Cirencester, born after January 1, 1901.

**R.—SWANWICK**, born after January 1, 1901.

**CLASS 106.—Pen of Three Cotswold Shearling Ewes.** [4 entries.]

**I. (£10.)—R. SWANWICK**, Royal Agricultural College Farm, Cirencester, born after January 1, 1900.

**II. (£5.) R. SWANWICK**, born after January 1, 1900.

**R.—W. HOULTON**, Broadfield Farm, Northleach, R.S.O., born January, 1900.

### DEVON LONG-WOOLLED.

**CLASS 107.—Devon Long-Woolled Shearling Ram.** [6 entries.]

**I. (£10.)—F. WHITE**, Torweston, Williton, born February, 1900.

**II. (£5.)—F. WHITE**, born February, 1900.

xliv *Prizes awarded to Kentish or Romney Marsh Sheep.*

**III. (£2).**—F. WHITE, born February, 1900.

**R.**—A. C. SKINNER, Pound Farm, Bishop's Lydeard, Somerset, born about February 1, 1900.

**C.**—A. C. SKINNER, born about February 1, 1900.

**CLASS 108.**—*Pair of Devon Long-Woolled Ram Lambs, dropped in 1901.* [5 entries.]

**I. (£10.)**—F. WHITE, Torweston, Williton, born February, 1901.

**II. (£5.)**—F. WHITE, born February, 1901.

**III. (£2.)**—A. C. SKINNER, Pound, Bishop's Lydeard, Somerset, born about February 1, 1901.

**R.**—A. C. SKINNER, born about February 1, 1900.

**H. C.**—A. C. SKINNER, born about February 1, 1900.

**CLASS 109.**—*Pen of Three Devon Long-Woolled Shearling Ewes.* [3 entries.]

**I. (£10.)**—F. WHITE, Torweston, Williton, born February, 1900.

**II. (£5.)**—F. WHITE, born February, 1900.

**III. (£2.)**—F. WHITE, born February, 1900.

**KENTISH OR ROMNEY MARSH.**

**CLASS 110.**—*Kentish or Romney Marsh Shearling Ram.* [13 entries.]

**I. (£10.)**—L. H. PAGE, Bobbing Court, Sittingbourne, born March, 1900.

**II. (£5.)**—C. FILE, Elham, Canterbury, born April 1, 1900.

**III. (£2.)**—C. FILE, born April 1, 1900.

**R.**—L. H. PAGE, born March, 1900.

**CLASS 111.**—*Pair of Kentish or Romney Marsh Ram Lambs, dropped in 1901.* [7 entries.]

**I. (£10.)**—C. FILE, Elham, Canterbury, born April, 1901.

**II. (£5.)**—L. H. PAGE, Bobbing Court, Sittingbourne, born February, 1901.

**III. (£2.)**—F. NEAME, Macknade, Faversham, born about March 10, 1901.

**R.**—H. RIGDEN, Lyminge, Hythe, born about middle of March, 1901.

**CLASS 112.**—*Pen of Three Kentish or Romney Marsh Shearling Ewes.* [12 entries.]

**I. (£10.)**—C. FILE, Elham, Canterbury, born April 1, 1900.

**II. (£5.)**—W. MILLEN, Syndale Valley, Faversham, Kent, born about March 26.

**III. (£2.)**—C. FILE, born April 1, 1900.

**R.**—H. RIGDEN, Lyminge, born middle of April, 1900.

### **SOUTHDOWN.**

#### **CLASS 113.—*Southdown Shearling Ram.* [21 entries.]**

**I. (£10)** and Special.\*—G. COURTAULD, Cut Hedge, Halstead, Essex, born February, 1900.

**II. (£5.)**—EARL OF ELLESMERE, Stetchworth Park, Newmarket, born February, 1900.

**III. (£2.)**—G. COURTAULD, born February, 1900.

**R.**—EARL OF ELLESMERE, born February, 1900.

#### **CLASS 114.—*Pair of Southdown Ram Lambs, dropped in 1901.* [15 entries.]**

**I. (£10.)**—Col. H. McCALMONT, M.P., Cheveley Park, Newmarket, born February 12, 1901.

**II. (£5.)**—Col. H. McCALMONT, M.P., born February 23, 1901.

**III. (£2.)**—C. ADEANE, Babraham Hall, Cambridge, born about February 1, 1901.

**R.**—EARL OF ELLESMERE, Stetchworth Park, Newmarket, born February, 1901.

#### **CLASS 115.—*Pen of Three Southdown Shearling Ewes.* [9 entries.]**

**I. (£10)** and Special.†—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmunds, born February, 1900.

**II. (£5.)**—Col. A. F. WALTER, Bear Wood, Wokingham, Berkshire, born between February 15 and 17, 1900.

**III. (£2.)**—G. COURTAULD, Cut Hedge, Halstead, Essex, born February, 1900.

**R.**—MRS. MONTEFIORE, Worth Park, Crawley, born March 1, 1900.

### **HAMPSHIRE DOWN.**

#### **CLASS 116.—*Hampshire Down Shearling Ram.* [11 entries.]**

**I. (£10.)**—J. FLOWER, Chilmark, Salisbury, born about February 5, 1900.

**II. (£5.)**—EARL OF CARNARVON, Highclere Castle, Newbury, born about January 20, 1900.

**III. (£2.)**—J. FLOWER, born about February 25, 1900.

**R.**—LORD ROTHSCHILD, Tring Park, Herts, born about January 10, 1900.

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\* Given by the Southdown Sheep Society, subject to Conditions stated in Prize List. A Gold Medal, value £10 10s., for the Best Ram or Ram Lamb in Class 113 or 114.

† Given by the Southdown Sheep Society, subject to Conditions stated in Prize List. A Silver Medal for the Best Pen of Ewes in Class 115.

xlvi *Prizes awarded to Hampshire Down and Shropshire Sheep.*

**H. C.**—T. F. BUXTON, Waters Place, Ware, Herts, born about January 25, 1900:—and his born about middle of January, 1900.

**C.**—EARL OF CARNAVON, born about January 20, 1900.

**CLASS 117.**—*Pair of Hampshire Down Ram Lambs, dropped in 1901.*  
[14 entries.]

**I. (£10.)**—J. FLOWER, Chilmark, Salisbury, born in 1901.

**II. (£5.)**—EARL OF CARNAVON, Highclere Castle, Newbury, born about January 10, 1901.

**III. (£2.)**—C. A. S. MURRAY, The Manor House, Hambleden, Henley-on-Thames, born January 10, 1901.

**R. & H. C.**—T. F. BUXTON, Waters Place, Ware, Herts, born about third week in January, 1901.

**H. C.**—Sir J. B. MAPLE, Bart., M.P., Childwick, St. Albans, born February 2, 1901:—LORD ROTHSCHILD, Tring Park, Herts, born about January 10, 1901:—and H. C. STEPHENS, Cholderton, Salisbury, born between January 10 and 15, 1901.

**C.**—L. H. BAXENDALE, Greenham Lodge, Newbury, born January 15, 1901:—and W. B. GREENFIELD, Manor Farm, Flamsteadbury, Redbourn, St. Albans, born January 15, 1901.

**CLASS 118.**—*Pen of Three Hampshire Down Shearling Ewes.*  
[6 entries.]

**I. (£10.)**—J. FLOWER, Chilmark, Salisbury, born about February 5, 1900.

**II. (£5.)**—C. A. S. MURRAY, The Manor House, Hambleden, Henley-on-Thames, born January, 1900.

**III. (£2.)**—J. FLOWER, born about January 25, 1900.

**R. & H. C.**—W. B. GREENFIELD, Manor Farm, Flamsteadbury, Redbourn, born January 15, 1900.

**H. C.**—Sir J. B. MAPLE, Bart., M.P., Childwick, St. Albans, born first week in February, 1900:—and H. C. STEPHENS, Cholderton, Salisbury, born between January 12 and 20, 1900.

**SHROPSHIRE.**

**CLASS 119.**—*Shropshire Shearling Ram.* [17 entries.]

**I. (£10.)**—R. P. COOPER, Ashlyn's, Berkhamstead, Herts, born February 12, 1900.

**II. (£5.)**—A. E. MANSELL, Harrington Hall, Shifnal, born February, 1900.

**III. (£2.)**—P. A. MUNTZ, M.P., Dunsmore, Rugby, born about March, 1900.

**R. & H. C.**—W. F. INGE, Thorpe Hall, Tamworth, born February or March, 1900.

**H. C.**—R. P. COOPER, born February 10, 1900:—W. F. INGE, born February or March, 1900:—A. E. MANSELL, born February, 1900:—his born February, 1900:—P. L. MILLS, Ruddington Hall, Nottingham, born 1900:—and his, born 1900.

[CLASS COMMENDED.]

**CLASS 120.—*Pair of Shropshire Ram Lambs, dropped in 1901.***

[3 entries.]

**I. (£10.)**—A. E. MANSELL, Harrington Hall, Shifnal, born February, 1901.

**II. (£5.)**—E. NOCK, Sutton Maddock, Shifnal, Salop, born end of February, 1901.

**R. & H. C.**—R. P. COOPER, Ashlyn's, Berkhamstead, Herts, born February 10, 1901.

**CLASS 121.—*Pen of Three Shropshire Shearling Ewes.* [8 entries.]**

**I. (£10.)**—R. P. COOPER, Ashlyn's, Berkhamstead, Herts, born March, 1900.

**II. (£5.)**—P. A. MUNTZ, M.P., Dunsmore, Rugby, born March, 1900.

**III. (£2.)**—P. L. MILLS, Ruddington Hall, Nottingham, born 1900.

**R. & H. C.**—W. F. INGE, Thorpe Hall, Tamworth, born February or March, 1900.

**H. C.**—R. P. COOPER, born March, 1900.

**C.**—T. FENN, Stonebrook House, Downton, Ludlow, born about March 15, 1900:—E. NOCK, Sutton Maddock, Shifnal, Salop, born end of February, 1900:—and A. TANNER, Shrawardine, Shrewsbury, born about first week of March, 1900.

**OXFORD DOWN.**

**CLASS 122.—*Oxford Down Shearling Ram.* [11 entries.]**

**I. (£10.)**—J. T. HOBBS, Maisey Hampton, Fairford, Gloucestershire, born February, 1900.

**II. (£5.)**—A. BRASSEY, M.P., Heythrop Park, Chipping Norton, born January, 1900.

**III. (£2.)**—A. BRASSEY, M.P., born January, 1900.

**R. & H. C.**—J. T. HOBBS, born February, 1900.

**H. C.**—A. BRASSEY, born January, 1900.

**C.**—H. W. STILGOE, The Grounds, Adderbury, near Banbury, born February 12, 1900.

**CLASS 123.—*Pair of Oxford Down Ram Lambs, dropped in 1901.***

[8 entries.]

**I. (£10.)**—A. BRASSEY, M.P., Heythrop Park, Chipping Norton, born January, 1901.

**II. (£5.)**—H. W. STILGOE, The Grounds, Adderbury, near Banbury, born February 1, 1901.

**III. (£2.)**—G. S. FISHER, Broughton Lodge, Kettering, born February 1 and 3, 1901.

**R. & H. C.**—R. W. HOBBS, Kelmscott, Lechlade, born about February 1, 1901.

**C.**—W. J. P. READING, Langford, Lechlade, Gloucestershire, born middle of January, 1901.

**CLASS 124.**—*Pen of Three Oxford Down Shearling Ewes.* [5 entries.]

**I. (£10).**—A. BRASSEY, M.P., Heythrop Park, Chipping Norton, born January, 1900.

**II. (£5).**—R. W. HOBBS, Kelmscott, Lechlade, born about February 1, 1900.

**R. & H. C.**—R. W. HOBBS, born about February 1, 1900.

#### **SOMERSET AND DORSET HORNED.**

**CLASS 125.**—*Somerset and Dorset Horned Shearling Ram.* [2 entries.]

**I. (£5).**—L. C. ATTRILL, Bowcombe Farm, Carisbrooke, Isle of Wight, Bowcombe No. 15 (vol. x. D.H.), born December 15, 1899.

**CLASS 126.**—*Pair of Somerset and Dorset Horned Ram Lambs, dropped after November 1st, 1900.* First prize, £5—second, £3—third, £2.

[No ENTRY.]

**CLASS 127.**—*Pen of Three Somerset and Dorset Horned Shearling Ewes.* [1 entry.]

**I. (£5).**—L. C. ATTRILL, Bowcombe Farm, Carisbrooke, Isle of Wight, born November and December, 1899.

## **P I G S.**

### **BERKSHIRE.**

**CLASS 128.**—*Berkshire Boar, farrowed in 1898, 1899, or 1900.*

[13 entries.]

**I. (£7) and Special (£5).\***—E. HAYTER, The Mount, Whitchurch, Hants, born June 20, 1899, bred by E. Burbidge, South Wrexall; s., Jack of All Trades; d., Stratton Polly; s. of d., Compton Lord.

**II. (£3).**—J. JEFFERSON, Peel Hall, Chester, **Peel King Edward 7th** (7564), born June 24, 1899, bred by E. Burbidge, South Wrexall; s., Jack of All Trades (6500); d., Stratton Mary (6811); s. of d., Stratton Teddy (5860).

**III. (£2).**—J. A. FRICKER, Burton, Mere, Wilts, **Bridgend F.**, born July 28, 1899; s., First Catch F.; d., Sister E.F.B.; s. of d., Prime Bacon.

**R. & H. C.**—G. T. TOMKIN, Marden, Kent, **Marden Monarch**, born September 2, 1899; s., Length and Quality; d., May Burton 3rd.

**C.**—Dr. F. R. HARRIS, Llangibby Castle, Usk, Mon., **Llangibby Black Prince** (7539), born January 5, 1900, bred by the Earl of Ashburnham,

\* Given by the British Berkshire Society for the Best Pig in the Berkshire Classes entered in, or eligible for, the Herd Book.

Ashburnham Place, Battle, Sussex; s., Sirdar (6630); d., Fashoda (6632); s. of d., Marmaduke:—and J. LAWRENCE, Stall Pitts, Shrivenham, born January 8, 1900, bred by J. Akerman, Grafton Manor, Faringdon; s., Laughing Stock (7695); d., Swig (7402); s. of d., Duke of Grafton (7392).

**CLASS 129.—Pair of Berkshire Boars, farrowed in 1901.**

[11 entries.]

**I. (£5).**—R. W. HUDSON, Danesfield, Great Marlow, born January 13, 1901; s., Manor Favourite; d. Gentle Jane (6806).

**II. (£2).**—J. A. FRICKER, Burton, Mere, Wilts, born January 3, 1901; s., First Catch F.; d., Gillingham F.; s. of d., Tapsay Hero.

**B. & C.**—GEORGE T. TOMKIN, Marden, Kent, born January 20, 1901; s., Marden Mac; d., Marden Marjory.

**CLASS 130.—Berkshire Breeding Sow, farrowed before 1901.**

[14 entries.]

**I. (£7).**—J. JEFFERSON, Peel Hall, Chester, **Peel Flirt** (7563), born May 28, 1899; s., Stratton Teddy (5860); d., Peel Venus (5880); s. of d., Elphick's King Pippin (4966).

**II. (£3).**—C. C. SMITH, Kingstone Common, Wantage, Berks, **Kingstone Matchless**, born January 2, 1900; s., Hautboy (4888); d., Queen of Hearts (7136); s. of d., Blackham (5215).

**III. (£2).**—A. HISCOCK, jun., Manor Farm, Motcombe, Dorset, **Manor Princess**, born March 12, 1900; s., Julius Cæsar (6957); d., Manor Horner (6561).

**IV. (£1).**—R. W. HUDSON, Danesfield, Great Marlow, **Danesfield Huntress** (7313), born January 8, 1899, bred by E. Hayter, Whitechurch; s., bred by C. Parsons; d. Huntress (7306); s. of d., Sir Visto (6789).

**B. & V. H. C.**—J. LAWRENCE, Stall Pitts, Shrivenham, **Longcott Lass** (7704), born September 10, 1899; s., Highclere Bachelor (5817); d., Lady Longcott (6719); s. of d., Longcott (5907).

**H. C.**—J. A. FRICKER, Burton, Mere, Wilts, born December 11, 1899; s., First Catch F.; d., Bright 7th; s. of d., Prime Bacon:—J. JEFFERSON, **Peel Agnes** (7333), born September 7, 1898; s., Peel Duke (6247); d., Peel Dora (6697); s. of d., Sir William (5574):—A. HISCOCK, jun., **Manor Beauty**, born March 10, 1899; s., Julius Cæsar (6957); d., May Burton 3rd (6459):—and G. T. TOMKIN, Marden, Kent, **Marden Duchess**, born March 8, 1900; s., Marden Duke; d., Marden Mystic.

**CLASS 131.—Pair of Berkshire Breeding Sows, farrowed in 1901.**

[14 entries.]

**I. (£5).**—R. W. HUDSON, Danesfield, Great Marlow, born January 20, 1901; s., Manor Favourite; d., Danesfield Gem (7311).

**II. (£2).**—J. A. FRICKER, Burton, Mere, Wilts, born January 2, 1901; s., First Catch F.; d., Torrington F.; s. of d., Tapsay Hero.

**III. (£1).**—R. W. HUDSON, born January 13, 1901; s., Manor Favourite; d., Gentle Jane (6806).

**B. & H. C.**—C. C. SMITH, Kingstone Common, Wantage, Berks, born January 18, 1901; s., Lisle Duke (vol. xvii.); d., Blanco (7135); s. of d., Blackham (5215).

*Prizes awarded to Pigs (Large Black Breed).*

**H. C.—A. HISCOCK**, jun., Manor Farm, Motcombe, Dorset, born January 2, 1901; s., First Rank F. (7422); d., Manor Gem (7460):—and **J. LAWRENCE**, Stall Pitt's Farm, Shrivenham, born March 1, 1901; s., Laccock (7401); d., North Field Star (6712); s. of d., Bank of England (4125).

**C.—Dr. F. R. HARRIS**, Llangibby Castle, Usk, Mon., born January 3, 1901, bred by J. A. Fricker, Burton, Mere, Wilts; s., First Catch (5925); d., Gillingham F. (5538); s. of d., Tapey Hero (4309):—and **G. T. TOMKIN**, Marden, Kent, born January 20, 1901; s., Marden Mac; d., Marden Marjory.

**LARGE BLACK.**

(£20 of the amount given in Prizes in Classes 132 to 135 was contributed by the Large Black Pig Society.)

**CLASS 132.—Large Black Boar, farrowed in 1898, 1899, or 1900.**  
[4 entries.]

**I. (£7).—F. F. MARRINER**, Hasketon, Suffolk, **Cornish Bean** (239), born January 20, 1900, bred by R. S. Olver, Trescowe; s., Cornishman (53); d., Trescowe Beauty 2nd (554).

**II. (£3).—J. and H. ROBINSON**, Ilford, Lewes, Sussex, **William the Conqueror** (163), born February, 1899, bred by Mr. Bartlett, Devon.

**R.—H. A. HOPE**, Cloughton Fields Dairy Farm, Cloughton, R.S.O., Yorkshire, **Cornishman**, born April 14, 1898, bred by W. Orchard, Trethorne, Launceston, Cornwall; s., Big Ben 1st (27); d., Duchess of Cornwall; s. of d., Happy Jack 2nd (81).

**C.—A. H. COBBALD**, Eldo House, Bury St. Edmunds, born June 2, 1900; s., Benwell (H.B., 25); d., Akenham Cornish Lass (H.B., 14).

**CLASS 133.—Pair of Large Black Boars, farrowed in 1901.**  
[2 entries.]

**I. (£5).—C. F. MARRINER**, Hasketon, Suffolk, born January 24, 1901; s., Akenham Link (9); d., Trescowe Jet (564).

**II. (£2).—H. A. HOPE**, Cloughton Fields Dairy Farm, Cloughton, R.S.O., Yorkshire, **Cloughton Telephone** and **Cloughton Harvester**, born February 1, 1901; s., Culpho Colonist (59); d., Jock Sunflower 1st (630); s. of d., Tideford Longsides (135).

**CLASS 134.—Large Black Breeding Sow, farrowed before 1901.**  
[8 entries.]

**I. (£7).—J. B. DIMMOCK**, Shotford Hall, Harleston, Norfolk, **Trescowe Bonny 2nd** (558), born March, 1897, bred by R. S. Olver, Trescowe, Cornwall; s., Orchard Jumbo (109); d., Trescowe Bonny 1st.

**II. (£3).—C. F. MARRINER**, Hasketon, Suffolk, **Trescowe Jet** (564), born March, 1898, bred by R. S. Olver, Trescowe; s., Tideford Longsides (135); d., Trescowe Beauty 2nd (554).

**III. (£2).—A. H. COBBALD**, Eldo House, Bury St. Edmunds, **Okenham Cornish Lass**, born 1897.

**R.—J. and H. ROBINSON**, Ilford, Lewes, Sussex, **Trescowe Soot** (568), born March, 1898, bred by R. S. Olver, Trescowe, Washaway, R.S.O., Cornwall; s., Tideford Longsides; d., Trescowe Beauty 2nd; s. of d., Orchard's Jumbo.

**C.—H. A. HOPE**, Cloughton Fields Dairy Farm, Cloughton, R.S.O., Yorkshire, **Penrose Rose 2nd** (376), born April 30, 1898; bred by S. Bastard, St. Tidy, R.S.O., Cornwall; s., Bodmin Ringleader (41); d., Penrose Rose 1st (374); s. of d., St. Austell:—and **C. F. MARRINER**, **Cornish Jet** (1164), born May 19, 1900, bred by R. S. Olver, Trescowe; s., Cornishman (53); d., Trescowe Jet (564); s. of d., Tideford Longsides (135).

**CLASS 135.—Pair of Large Black Breeding Sows, farrowed in 1901.**  
[2 entries.]

**I. (£5.)—H. A. HOPE**, Cloughton Fields Dairy Farm, Cloughton, R.S.O., Yorkshire, **Cloughton Pattie** and **Cloughton Lena**, born February 1, 1901; s., Culpho Colonist (59); d., York Sunflower 1st (630); s. of d., Tideford Longsides (135).

**II. (£2.)—J. B. DIMMOCK**, Shotford Hall, Harleston, Norfolk, born January 7, 1901; s., Cornishman (53); d., Trescowe Bonny 2nd (558); s. of d., Orchard's Jumbo (109).

## **LARGE WHITE.**

**CLASS 136.—Large White Boar, farrowed in 1898, 1899, or 1900.**  
[4 entries.]

**I. (£7.)—Sir G. GREENALL**, Bart., Walton Hall, Warrington, **Walton What's Wanted 2nd**, born February 28, 1898; s., Walton What's Wanted (4067); d., Walton Belle 4th (6780); s. of d., Walton Eclipse (3621).

**II. (£2.)—Sir G. GREENALL**, Bart., **Walton Regent**, born March 1, 1898; s., Long Sam (339); d., Walton Duchess 6th (7488); s. of d., Walton Eclipse (3621).

**R.—S. SPENCER**, Holywell Manor, St. Ives, Hunts, **Holywell Hugh**, born July 17, 1899; s., Holywell Dismal Jimmy; d., Holywell Star; s. of d., Holywell Dublin.

**CLASS 137.—Pair of Large White Boars, farrowed in 1901.**  
[4 entries.]

**I. (£5.)—D. R. DAYBELL**, Bottesford, Nottingham, born January 3, 1901; s., Bottesford Long Sam (vol. xvii.); d., Bottesford Queen 12th (vol. xvii.).

**II. (£2.)—S. SPENCER**, Holywell Manor, St. Ives, Hunts, born January 11, 1901; s., Holywell Elephant; d., Holywell Kathleen 5th; s. of d., Holywell Dublin.

**CLASS 138.—Large White Breeding Sow, farrowed before 1901.**  
[6 entries.]

**I. (£7.)—D. R. DAYBELL**, Bottesford, Nottingham, **Bottesford Model** (8632), born February 12, 1898; s., Bottesford Rufford (3903); d., Bottesford Lady 3rd (6492).

**II. (£3.)—D. R. DAYBELL**, **Bottesford Perfection** (8634), born January 25, 1898; s., Bottesford Rufford (3903); d., Bottesford Expectation (7930).

**III. (£2.)—A. HISCOCK**, jun., Manor Farm, Motcombe, Dorset, **Manor**  
d 2

**Betsy**, born January 3, 1898; s., Candidate (3453); d., Lady Bedford (vol. xiv. p. 152).

**R. & H. C.**—Sir G. GREENALL, Bart., Walton Hall, Warrington, **Walton Sarah 3rd** (9748), born March 2, 1899; s., Walton What's Wanted (4067); d., Walton Sarah (7502); s. of d., Long Sam (339).

**C.**—Sir G. GREENALL, Bart., **Walton Sarah 4th** (9750), born March 2, 1899; s., Walton What's Wanted (4067); d., Walton Sarah (7502); s. of d., Long Sam (339):—and S. SPENCER, Holywell Manor, St. Ives, Hunts, **Holywell Caesarina**, born August 18, 1898; s., Holywell Dublin; d., Holywell Princess Royal.

**CLASS 139.—Pair of Large White Breeding Sows, farrowed in 1901.**  
[4 entries.]

**I. (£5.)**—D. R. DAYBELL, Bottesford, Nottingham, born January 4, 1901; s., Bottesford Long Sam (vol. xvii.); d., Bottesford Queen 11th (vol. xvii.).

**II. (£2.)**—S. SPENCER, Holywell Manor, St. Ives, Hunts, born January 11, 1901; s., Holywell Elephant; d., Holywell Kathleen 5th; s. of d., Holywell Dublin.

**R. & H. C.**—A. HIRCOCK, jun., Manor Farm, Motcombe, Dorset, born January 2, 1901; s., Duke Lancaster 3rd (4821); d., Manor Favourite (8068).

**MIDDLE WHITE.**

**CLASS 140.—Middle White Boar, farrowed in 1898, 1899, or 1900.**  
[3 entries.]

**I. (£7.)**—S. SPENCER, Holywell Manor, St. Ives, Hunts, **Holywell Rosador**, born January 14, 1899; s., Holywell Stumpy Tail; d., Holywell Rosy Girl; s. of d., Holywell Count.

**II. (£3.)**—Sir G. GREENALL, Bart., Walton Hall, Warrington, **Walton John**, born March 6, 1899; s., Walton Surprise (4175); d., Walton Bridesmaid 2nd (9112); s. of d., Walton Editor (4499).

**R. & H. C.**—A. C. TWENTYMAN, Castlecroft, Wolverhampton, **Castlecroft Claudius**, born March 12, 1899; s., Castlecroft Royal Emperor (4855); d., Castlecroft Ladybird 2nd (9024); s. of d., Castlecroft Robin Hood (3651).

**CLASS 141.—Pair of Middle White Boars, farrowed in 1901.**  
[4 entries.]

**I. (£5.)**—S. SPENCER, Holywell Manor, St. Ives, Hunts, born January 10, 1901; s., Holywell Count Curly; d., Holywell Rosadora; s. of d., Holywell Stumpy Tail.

**II. (£2.)**—Sir G. GREENALL, Bart., Walton Hall, Warrington, born January 6, 1901; s., Walton Andrew; d., Walton Rose 10th (9134); s. of d., Walton Editor (4499).

**CLASS 142.—Middle White Breeding Sow, farrowed before 1901.**  
[8 entries.]

**I. (£7.)**—Sir G. GREENALL, Bart., Walton Hall, Warrington, **Walton Rose 8th** (9130), born November 26, 1897; s., Walton Editor (4499); d., Walton Rose 2nd (6928); s. of d., Walton Major (3695).

*Prizes awarded to Pigs (Small White or Black Breed). lili*

**II. (£2).**—S. SPENCER, Holywell Manor, St. Ives, Hunts, **Holywell Middleboro' 2nd**, born September 1, 1898; s., Holywell John Bull; d., Holywell Victorine; s. of d., Holywell Count.

**III. (£2).**—S. SPENCER, **Holywell Rosy O'Grady**, born January 14, 1898; s., Holywell Stumpy Tail; d., Holywell Rosy Girl; s. of d., Holywell Count.

**R.**—J. JEFFERSON, Peel Hall, Chester, born July 30, 1899, bred by P. Ascroft, Rufford, Ormskirk; s., Rufus 9th (5313); d., Rufford Sawdrow, (9090); s. of d., Rufford Ploughboy (4491).

**C.**—Sir G. GREENALL, Bart., **Walton Rose 10th** (9134), born November 26, 1897; s., Walton Editor (4499); d., Walton Rose 2nd (6928); s. of d., Walton Major (3695):—A. C. TWENTYMAN, Castlecroft, Wolverhampton, **Castlecroft Lavender**, born January 22, 1898; s., Castlecroft Robin Hood (3651); d., Castlecroft Lady Leicester (7590); s. of d., Morden Pure Gold (3253):—and his **Castlecroft Peggy 2nd**, born July 10, 1898; s., Holywell (4465); d., Peggy.

**CLASS 143.—Pair of Middle White Breeding Sows, farrowed in 1901.**  
[5 entries.]

**I. (£5).**—S. SPENCER, Holywell Manor, St. Ives, Hunts, born January 17, 1901; s., Holywell Count Curl; d., Holywell Victoria Countess; s. of d., Holywell Count.

**II. (£2).**—A. HISCOCK, jun., Manor Farm, Motcombe, Dorset, born January 5, 1901; s., Manor Grandee (vol. xvii.); d., Manor Louise (vol. xvii.).

**R. & H. C.**—Sir G. GREENALL, Bart., Walton Hall, Warrington, born January 4, 1901; s., Walton Andrew; d., Walton Rose 8th (9130); s. of d., Walton Editor (4499).

**C.**—The DUCHESS OF NEWCASTLE, Clumber, Worksop, born January 4, 1901; s., Walton Surprise (4175); d., Hardwick Beauty; s. of d., Metchley Silver Locks 2nd (vol. xvi.):—and A. C. TWENTYMAN, Castlecroft, Wolverhampton, born January 10, 1901; s., Castlecroft Dreamer 3rd (5271); d., Castlecroft Daffodil (6874); s. of d., Castlecroft Robin Hood (3651).

**SMALL WHITE OR SMALL BLACK.**

**CLASS 144.—Small White or Small Black Boar, farrowed in 1898, 1899, or 1900.** [2 entries.]

**I (£7).**—Hon. D. P. BOUVERIE, Cole-hill House, Highworth, Wilts, born May 26, 1900; s., Colehill Edward (4509); d., Colehill Sunbeam 2nd (5458).

**II (£3).**—Sir G. GREENALL, Bart., Walton Hall, Warrington, **Walton Champion**, born February 27, 1899; s., Temple Champion (4179); d., Colehill Fairy (6938); s. of d., Prescott (2897).

**CLASS 145.—Pair of Small White or Small Black Boars, farrowed in 1901.** [2 entries.]

**I. (£5).**—Sir G. GREENALL, Bart., Walton Hall, Warrington, born January 18, 1901; s., Colehill Royal Emperor (4521); d., Jewel 4th.

**II (£2).**—Hon. D. P. BOUVERIE, Colehill House, Highworth, Wilts, born January 5, 1901; s., Colehill Jim; d., Colehill Grace; s. of d., Colehill Edward (4509).

**CLASS 146.—*Small White or Small Black Breeding Sow, farrowed before 1901.* [3 entries.]**

**I. (£7.)**—Hon. D. P. BOUVERIE, Coleshill House, Highworth, Wilts, born May 26, 1900; s., Coleshill Edward (4509); d., Coleshill Sunbeam 2nd (5458).

**II. (£3.)**—Hon. D. P. BOUVERIE, born March 16, 1900; s., Coleshill Jim; d., Coleshill Grace; s. of d., Coleshill Edward (4509).

**R. & H. C.**—Sir G. GREENALL, Bart., Walton Hall, Warrington, Walton Sissy, born May 17, 1899; s., Norfolk Model (5331); d., Walton Tiny (7706); s. of d., Prescott (2897).

**CLASS 147.—*Pair of Small White or Small Black Breeding Sows, farrowed in 1901.* [3 entries.]**

**I. (£5.)**—Hon. D. P. BOUVERIE, Coleshill House, Highworth, Wilts, born January 5, 1901; s., Coleshill Jim; d., Coleshill Grace; s. of d., Coleshill Edward (4509).

**II. (£2.)**—Sir G. GREENALL, Bart., Walton Hall, Warrington, born January 18, 1901; s., Coleshill Royal Emperor (4521); d., Jewel 4th.

**R.**—A. HISCOCK, jun., Manor Farm, Motcombe, Dorset, born January 3, 1901; s., Manor Tommy (vol. xvii.); d., Manory Tin (vol. xvii.).

### TAMWORTH.

**CLASS 148.—*Tamworth Boar, farrowed in 1898, 1899, or 1900.* [3 entries.]**

**I. (£7.)**—R. IBBOTSON, Knowle, Warwickshire, born January 8th, 1900, bred by H. C. Stephens, Cholderton, Salisbury; s., Whitacre Welshman; d., Whitacre Beauty; s. of d., Warwickshire Monarch.

**II. (£3.)**—H. C. STEPHENS, Cholderton Lodge, Salisbury, Knowle Forester, born April 28, 1898, bred by R. Ibbotson, Knowle, Birmingham; s., Knowle Rambler; d., Knowle Duchess 2nd (8436); s. of d., Warwickshire Monarch (4597).

**R.**—D. W. PHILIP, The Ashes, Whitacre, Birmingham, Amington Duke (5753), born December 18, 1898, bred by T. Watson, Whitacre Hall, Coleshill; s., Knowle Churchwarden (4937); d., Warwickshire Daisy 2nd; s. of d., Gun Hill Prince (1591).

**CLASS 149.—*Pair of Tamworth Boars, farrowed in 1901.* [6 entries.]**

**I. (£5.)**—R. IBBOTSON, Knowle, Warwickshire, born January 3, 1901; s., Knowle Meteor (5787); d., Knowle Vesta (9248); s. of d., Lord Chamberlain.

**II. (£2.)**—R. IBBOTSON, born January 2, 1901; s., Knowle Forester (5369); d., Knowle Mayflower (7094); s. of d., Knowle Major.

**III. (£1.)**—D. W. PHILIP, The Ashes, Whitacre, Birmingham, born January 8, 1901; s., Whitacre Welshman (5411); d., Whitacre Countess 3rd (9322); s. of d., Cliff Crystal (4923).

**R.**—H. C. STEPHENS, Cholderton Lodge, Salisbury, born January 7, 1901;

s., Knowle Hing 3rd; d., Whitacre Beauty (8526); s. of d., Warwickshire Monarch (4597).

**C.—D. W. PHILIP**, The Ashes, Whitacre, Birmingham, born January 1, 1901; s., Knowle Hiawatha (5781); d., Whitacre Susan; s. of d., Whitacre Lawyer (4985).

**CLASS 150.—*Tamworth Breeding Sow, farrowed before 1901.***  
[5 entries.]

**I. (£7.)—D. W. PHILIP**, The Ashes, Whitacre, Birmingham, **Whitacre Favourite 3rd** (10,046), born February 7, 1899; s., Whitacre Welshman (5411); d., Whitacre Favourite (7830); s. of d., Knowle Rector.

**II. (£8.)—R. IBBOTSON**, Knowle, Warwickshire, born March 1, 1900; s., Goldfinder; d., Knowle Mayflower; s. of d., Knowle Major.

**R.—W. E. BALSTON**, Barvin, Potters' Bar, **Barvin Medea 4th**, born March 13, 1899; s., Barvin Hamza (5345); d., Barvin Medea (8400); s. of d., Barvin Tom (4181).

**H. C.—D. W. PHILIP**, **Whitacre Matchless** (10,050), born May 30, 1899; s., Whitacre Lawyer (4985); d., Whitacre Madam (9330); s. of d., Knowle Church Warden.

**C.—H. C. STEPHENS**, Cholderton Lodge, Salisbury, born January 10, 1900; s., Whitacre Welshman (4597); d., Whitacre Beauty (8526); s. of d., Warwickshire Monarch (3781).

**CLASS 151.—*Pair of Tamworth Breeding Sows, farrowed in 1901.***  
[6 entries.]

**I. (£5.)—R. IBBOTSON**, Knowle, Warwickshire, born January 2, 1901; s., Knowle Forester (5369); d., Knowle Mayflower (7094); s. of d., Knowle Major.

**II. (£2.)—R. IBBOTSON**, born January 3, 1901; s., Knowle Meteor (5787); d., Knowle Vesta (9248); s. of d., Lord Chamberlain.

**III. (£1.)—H. C. STEPHENS**, Cholderton Lodge, Salisbury, born January 7, 1901; s., Knowle King 3rd (4945); d., Whitacre Beauty; s. of d., Warwickshire Monarch (4597).

**R.—D. W. PHILIP**, The Ashes, Whitacre, Birmingham, born January 6, 1901; s., Knowle Hiawatha (5781); d., Whitacre Royal Countess (10,056); s. of d., Whitacre Welshman (5411).

**C.—H. C. STEPHENS**, born January 24, 1901; s., Knowle King 3rd (4245); d., Whitacre Favourite (7896); s. of d., Knowle Rector.



## PRODUCE.

## PRIZES FOR CIDER.

(Open to Growers or Makers.)

*First Prize in each Class, a Silver Medal and a Certificate ; Second Prize in each Class, a Bronze Medal and a Certificate.**Champion Prize, for Best Exhibit in any of the Classes, a Gold Medal and a Certificate.*

(The Cider must have been made in 1900, and each Exhibit in Cask consisted of not less than 18 gallons.)

## Cider made in Devon.

CLASS 152.—*Cask of Cider, containing not less than 4 per cent. of Alcohol.*

[NO ENTRY.]

CLASS 153.—*12 Bottles of Cider, containing not less than 4 per cent. of Alcohol.* [1 entry.]

[NO AWARD.]

CLASS 154.—*Cask of Cider, containing less than 4 per cent. of Alcohol.*

[NO ENTRY.]

CLASS 155.—*12 Bottles of Cider, containing less than 4 per cent. of Alcohol.* [2 entries.]

[NO AWARD.]

## Cider made in Herefordshire.

CLASS 156.—*Cask of Cider, containing not less than 4 per cent. of Alcohol.* [1 entry.]

[NO AWARD.]

CLASS 157.—*12 Bottles of Cider, containing not less than 4 per cent. of Alcohol.* [1 entry.]

[NO AWARD.]

CLASS 158.—*Cask of Cider, containing less than 4 per cent. of Alcohol.* [1 entry.]

[NO AWARD.]

CLASS 159.—*12 Bottles of Cider, containing less than 4 per cent. of Alcohol.* [5 entries.]

I.—YEOMANS BROS.

II.—J. BAZLEY.

R.—J. BOSLEY.

**Cider made in Somerset.**

**CLASS 160.**—*Cask of Cider, containing not less than 4 per cent. of Alcohol.* [9 entries.]

**I.**—D. J. CROFTS AND SON.

**II.**—W. T. S. TILLEY.

**R.**—D. J. CROFTS AND SON.

**H. C.**—E. WELLINGTON.

**CLASS 161.**—*12 Bottles of Cider, containing not less than 4 per cent. of Alcohol.*

**I. and Champion.**—Rev. E. P. SPURWAY.

**II.**—W. T. S. TILLEY.

**R.**—Rev. E. P. SPURWAY.

**H. C.**—W. T. S. TILLEY.

**C.**—D. J. CROFTS AND SON:—and W. T. S. TILLEY.

**CLASS 162.**—*Cask of Cider, containing less than 4 per cent. of Alcohol.* [5 entries.]

**I.**—D. J. CROFTS AND SON.

**CLASS 163.**—*12 Bottles of Cider, containing less than 4 per cent. of Alcohol.* [7 entries.]

**I. and R. for Champion.**—J. WATTS AND CO.

**II.**—W. T. S. TILLEY.

**R.**—D. J. CROFTS AND SON.

**C.**—W. T. S. TILLEY.

**Cider made in Counties other than Devon, Hereford, or Somerset.**

**CLASS 164.**—*Cask of Cider, containing not less than 4 per cent. of Alcohol.* [1 entry.]

[No Award.]

**CLASS 165.**—*12 Bottles of Cider, containing not less than 4 per cent. of Alcohol.* [2 entries.]

[No Award.]

**CLASS 166.**—*Cask of Cider, containing less than 4 per cent. of Alcohol.* [1 entry.]

[No Award.]

**CLASS 167.**—*12 Bottles of Cider, containing less than 4 per cent. of Alcohol.* [3 entries.]

**II.**—H. THOMSON.

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## CHEESE.

CLASS 168.—*Three Cheeses (not less than 56 lbs. each) made in 1900.*  
[10 entries.]

- I. (£15.)—F. W. J. CROCKER.
- II. (£10.)—H. CANNON.
- III. (£5.)—F. L. ASHBY.
- R.—H. WHITE.
- V. H. C.—T. C. CANDY.
- H. C.—W. W. KEEL :—and T. PARFITT.
- C.—E. T. GREEN.

CLASS 169.—*Three Cheddar Cheeses (not less than 28 lbs. each) made in 1900 by a Student who had received not less than a week's instruction in one of the Society's Cheese Schools.* [8 entries.]

- I. (£8.)—MRS. C. CREIGHTON.
- II. (£5.)—MRS. R. A. PERRY.
- III. (£3.)—MRS. W. T. S. TILLEY.
- R.—MISS L. BUTLER.

CLASS 170.—*Three Cheeses (not less than 28 lbs. each) made in 1901.*  
[11 entries.]

- I. (£8.)—E. T. GREEN.
- II. (£5.)—H. CANNON.
- III. (£3.)—J. SAGE.
- R.—H. WHITE.
- H. C.—F. W. J. CROCKER.

CLASS 171.—*Three Cheddar Cheeses (not less than 28 lbs. each) made in 1901 by a Student who had received not less than a week's instruction in one of the Society's Cheese Schools.* [2 entries.]

- I. (£6.)—MRS. R. A. PERRY.
- R.—MRS. W. T. S. TILLEY.

CLASS 172.—*Four Single Gloucester Cheeses, total weight not to exceed 60 lbs.* [3 entries.]

(The Prizes in Class 172 were given by Mr. G. E. Lloyd-Baker.)

- I. (£2.)—MRS. W. T. S. TILLEY.
- II. (£1.)—G. PROUT.

CLASS 173.—*Eight Loaf or other Truckle Cheeses made in 1901.*  
[10 entries.]

- I. (£5.)—H. CANNON.
- II. (£3.)—MRS. M. CANDY.
- III. (£2.)—E. M. COLES.
- R.—H. WHITE.

CLASS 174.—*Three Caerphilly Cheeses made in 1901.* [7 entries.]

I. (£3).—MRS. W. T. S. TILLEY.

II. (£2).—J. BOARD.

III. (£1).—F. HOUSE.

CLASS 175.—*Three Cream or other Soft Cheeses.* [14 entries.]

I. (£3).—LADY DE ROTHSCHILD.

II. (£2).—MRS. MCINTOSH.

III. (£1).—EXPRESS DAIRY COMPANY.

R.—SIR J. BLYTH, Bart.

## BUTTER AND CREAM.

(These Classes are not open to Professional Teachers.)

CLASS 176.—*3 lbs. of Fresh (or very slightly salted) Butter, made of Cream from Cows other than Channel Island Breeds.* [15 entries.]

I. (£4).—C. HAYES.

II. (£3).—MRS. ADLAM.

III. (£2).—EARL OF ROSEBURY.

IV. (£1).—MISS L. WALKER.

CLASS 177.—*3 lbs. of Fresh (or very slightly salted) Butter, made of Cream from Cows of Channel Island Breeds only.* [22 entries.]

I. (£4) and Special (£1).\*—MRS. MCINTOSH.

II. (£3).—C. COMBE.

III. (£2) and Special (£1).\*—C. W. ARMITAGE.

IV. (£1).—SIR J. BLYTH, Bart.

R.—EARL OF ROSEBURY.

CLASS 178.—*3 lbs. of Fresh (or very slightly salted) Butter, made from Scalded Cream.* [14 entries.]

I. (£4) and Special (£1).\*—C. HAYES.

II. (£3).—A. F. SOMERVILLE.

III. (£2).—LORD ROTHSCHILD.

R.—SIR J. BLYTH, Bart.

V. H. C.—MRS. MCINTOSH.

\* Three Special Prizes of £1 each were given for Butter which had the best keeping qualities, exhibited in Class 176, 177, 178 or 179. 1 lb. was taken on the first day of the Show from each Prize Lot of Butter in the Classes named, and was judged on the last day of the Show.

**CLASS 179.**—*3 lbs. of Butter, to which no salt whatever has been added.*  
[26 entries.]

**I. (£4.)**—C. COMBE.

**II. (£3.)**—C. W. ARNITAGE.

**III. (£2.)**—LADY DE ROTHSCHILD.

**IV. (£1.)**—Sir J. BLYTH, Part.

**R.**—EARL OF ROSEBURY.

**V. H. C.**—LORD ROTHSCHILD:—and A. F. SOMERVILLE.

**H. C.**—LADY CALTHORPE:—and C. E. KEYSER.

**CLASS 180.**—*12 lbs. of Salted Butter, in a jar or crock, delivered to the Secretary four weeks before the Show.* [8 entries.]

**I. (£4.)**—C. HAYES.

**II. (£3.)**—A. GIBBS.

**III. (£2.)**—Miss M. G. PRIDEAUX.

**CLASS 181.**—*Four half-pounds of Clotted or Devonshire Cream.*  
[9 entries.]

**I. (£3.)**—Miss B. DRYAN.

**II. (£2.)**—LADY CALTHORPE.

**III. (£1.)**—LORD POLTIMORE.

**R.**—Miss E. G. COOK.

## BUTTER-MAKING COMPETITIONS.

Professional Teachers, Makers or Vendors of Churns, or persons in any way representing the interests of Makers or Vendors of Churns, were not eligible to compete in the Butter-making Classes. This Regulation was strictly enforced.

No Winner of a First Prize given by this Society for Butter-making during the last three years, or any winner of the Society's Gold Medal, was eligible to compete in Classes 182 to 185.

(These Prizes were awarded for the Best and Largest quantity of Butter made from a given quantity of Cream in the cleanest and most approved method.)

**CLASS 182.**—*On the first day of the Show, open to any Dairymaid working for wages in a dairy belonging to a tenant farmer.*  
[6 entries.]

**I. (£4.)**—Miss E. WOOLFE.

**II. (£3.)**—Miss K. A. BAYNES.

**III. (£2.)**—Miss L. WALKER.

**R. & H. C.**—Miss H. C. ABRISS.

**CLASS 183.**—*On the second day of the Show, open to any Man or Woman (except the winner in Class 182) who had never won a First Prize in any open Butter-making Competition.* [14 entries.]

**I. (£4.)**—Miss E. FOLLETT.

**II. (£3.)**—Miss J. JAMES.

**III. (£2.)**—Miss H. C. ABBISS.

**R. & V. H. C.**—Miss L. WALKER.

**H. C.**—Miss L. COOK :—Miss J. GARBUTT :—Mrs. A. HODGE :—Miss M. NISBET :—and Miss E. W. STUBBS.

**CLASS 184.**—*On the third day of the Show, open to any Man or Woman, except the winners of the First Prizes in Classes 182 and 183.* [31 entries.]

**I. (£4.)**—Miss E. M. A. CROOK.

**II. (£3.)**—Miss A. B. WALKER.

**III. (£2.)**—Miss I. A. CABLE.

**IV. (£1.)**—Mrs. N. COMER.

**R. & V. H. C.**—Miss E. W. STUBBS.

**H. C.**—Miss H. C. ABBISS :—Miss K. A. BAYNES :—Miss J. GARBUTT :—Mrs. W. GREEN :—Miss J. JAMES :—Miss G. LAWRENCE :—Miss C. McDUFF :—Miss M. NISBET :—Miss D. H. PATTISON :—Miss T. A. PICKARD :—Miss E. T. ROWE :—Miss I. RUTHERFORD :—and Miss L. WALKER.

**C.**—Miss L. COOK :—W. J. CRIPPS :—Miss B. DAWSON :—Miss C. E. FORDHAM :—Mrs. A. HODGE :—Miss A. JONES :—Mrs. N. ROBINSON :—Mrs. M. F. SANDERS :—and Mrs. L. B. TURNER.

**CLASS 185.**—*On the fourth day of the Show, open to any Man or Woman, except the Winners of the First Prizes in Classes 182, 183, and 184.* [32 entries.]

**I. (£4.)**—Miss A. B. WALKER.

**II. (£3.)**—Miss E. T. ROWE.

**III. (£2.)**—Mrs. N. COMER.

**IV. (£1.)**—Miss C. McDUFF.

**R. & V. H. C.**—Miss G. LAWRENCE.

**H. C.**—Miss H. C. ABBISS :—Miss V. ASTLEY SPARKE :—Miss K. A. BAYNES :—Miss L. COOK :—Miss J. GARBUTT :—Miss E. M. HALL :—Miss J. JAMES :—Miss A. JONES :—Miss M. NISBET :—Miss T. A. PICKARD :—Miss I. RUTHERFORD :—Mrs. M. F. SANDERS :—Miss E. W. STUBBS :—Mrs. L. B. TURNER :—and Miss L. WALKER.

**C.**—Miss E. GEACH :—Mrs. W. GREEN :—Mrs. A. HODGE :—Miss M. MERRIMAN :—Miss D. H. PATTISON :—and Mrs. N. ROBINSON.

**CLASS 186.**—*On the fifth day of the Show, open to any Man or Woman who had not won the Society's Gold Medal—Silver Bowl, value £5 5s.* [29 entries.]

(The Prize in Class 186 was given by Professor Carroll.)

**I.**—Miss E. WOOLFE.

**R. & V. H. C.**—Miss J. STUBBS.

**V. H. C.**—Miss J. GARBUTT:—Miss G. LAWRENCE:—and Miss A. B. WALKER.

**H. C.**—Miss K. A. BAYNES:—Miss E. M. A. CROOK:—Miss A. JONES:—Mrs. F. C. LOXTON:—and Miss T. A. PICKARD.

### CHAMPION CLASS.

**CLASS 187.**—*On the fifth day of the Show, open to Winners of First and Second Prizes in the Butter Making Classes at this or any previous Meeting of the Society.*—First Prize, Gold Medal—second, Silver Medal—third, Bronze Medal.

**I.**—Miss H. C. ABBISS.

**II.**—Miss J. STUBBS.

**III.**—Miss E. WOOLFE.

**R.**—Miss G. LAWRENCE.

### MILKING COMPETITIONS.

**CLASS 188.**—*For Men twenty years of age and over.* [9 entries.]

**I.** (£1 10s.)—J. FRICKER, jun.

**II.** (£1.)—W. ELTON.

**III.** (15s.)—A. ALDER.

**IV.** (10s.)—F. MARTIN.

**R.** S. ROBBINS.

**C.**—J. BYERS.

**CLASS 189.**—*For Women twenty years of age and over.* [6 entries.]

**I.** (£1 10s.)—Miss J. RUTHERFORD.

**II.** (£1.)—Miss M. NISBET.

**III.** (15s.)—Mrs. BYERS.

**IV.** (10s.)—Miss D. H. PATTISON.

**CLASS 190.**—*For Boys and Girls under twenty years of age.*  
[3 entries.]

**I.** (£1 10s.)—G. BROWN.

**II.** (£1.)—J. BROWN, jun.

**III.** (15s.)—J. NISBET.

## **LOCAL DAIRY PRIZES.**

(Offered by the Technical Education Committees of the County of Surrey and the County Borough of Croydon, and confined to Residents in the Administrative Counties of Surrey and Croydon.)

### **BUTTER AND CREAM.**

(These Classes were not open to Professional Teachers.)

**CLASS 195.**—3 lbs. of *Fresh (or very slightly salted) Butter, made of Cream from Cows other than Channel Island Breeds.*—First Prize, £4—second, £3—third, £2.

[No Entry.]

**CLASS 196.**—3 lbs. of *Fresh (or very slightly salted) Butter, made of Cream from Cows of Channel Island Breeds only.* [1 entry.]

**I. (£4).**—C. COMBE.

**CLASS 197.**—*Four half-pounds of Clotted or Devonshire Cream.*  
[3 entries.]

**I. (£2).**—F. and H. E. HORNBY.

**II. (£1).**—F. and H. E. HORNBY.

### **BUTTER-MAKING.**

Professional Teachers, Makers or Vendors of Churns, or persons in any way representing the interests of Makers or Vendors of Churns, were not eligible to compete in the Butter-making Classes. This Regulation was strictly enforced.

These Prizes were awarded for the Best and largest quantity of Butter made from a given quantity of Cream in the cleanest and most approved method.

**CLASS 198.**—*On the first day of the Show.* [4 entries.]

**I. (£4).**—Miss A. H. MEDHURST.

**II. (£3).**—Miss M. E. GORDON.

**R. & V. H. C.**—Miss M. D. ASHCROFT.

**C.**—Miss N. P. MEDHURST.

**CLASS 199.**—*On the second day of the Show.* [3 entries.]

**I. (£4).**—Miss M. D. ASHCROFT.

**II. (£3).**—Miss N. P. MEDHURST.

**R. & V. H. C.**—Miss A. H. MEDHURST.

**CLASS 200.**—*On the third day of the Show.* [5 entries.]

**I. (£4).**—Miss I. A. CABLE.

**II. (£3).**—Miss A. H. MEDHURST.

**R.**—Miss M. D. ASHCROFT.

**H. C.**—Miss M. E. GORDON:—and Miss N. P. MEDHURST.

CLASS 201.—*On the fourth day of the Show. [3 entries.]*

I. (£4.) Miss M. E. GORDON.

II. (£3.)—Miss A. H. MEDHURST.

R. & V. H. C.—Miss N. P. MEDHURST.

## HORSE-SHOEING COMPETITIONS.

The Registration Committee of the Farriers' Company admitted Winners of First Prizes in these Competitions to the Official Register *free of charge*, on their satisfying the Judges that they had a fair knowledge of the structure of the horse's foot, and on the necessary application being made to the Company in the prescribed form; and other Competitors, who satisfied the Judges of their competency, on payment of the usual fees. The minimum ages for Registration are: R.S.S., 25 years; Doormen, 21 years.

CLASS 191.—*Best Shoeing of a Nag Horse on the third day of the Show, by a Smith, over twenty-five years of age, who had not previously won the First Prize in a corresponding class at one of the Society's Meetings, or a Champion Prize at any Show in England.*

I. (£4.)—T. DAVIES, R.S.S.

II. (£3.)—F. GODDARD.

III. (£2.)—J. S. SANDERS.

IV. (£1.)—H. GREENBANK.

R. & V. H. C.—S. BAYLISS.

V. H. C.—W. A. BEARMAN:—J. J. KERSLAKE, R.S.S.:—F. MAY:—F. SMITH, R.S.S.:—and J. H. WRIGHT.

H. C.—W. GANTRY:—E. PROSSER, R.S.S.:—S. THOMPSON:—and L. C. TITMUS.

(Three Prizes were also given by the County Councils of Kent and Surrey in Class 191, for Competitors who had attended any of the Farriery Classes held in connection with the South Eastern Agricultural College.)

I. (£3.)—F. SMITH.

II. (£2.)—W. GANTRY.

III. (£1.)—J. REEVES.

R. & H. C.—W. SAND.

CLASS 192.—*Best Shoeing of a Cart Horse on the fourth day of the Show, by a Smith, over twenty-five years of age, who had not previously won the First Prize in a corresponding class at one of the Society's Meetings, or a Champion Prize at any Show in England. [38 entries.]*

I. (£4.)—S. THOMPSON.

II. (£3.)—W. STANTON, R.S.S.

**III. (£2).**—J. H. WRIGHT.

**IV. (£1).**—F. MAY.

**R. & V. H. C.**—J. J. KERSLAKE, R.S.S.

**V. H. C.**—P. BROWN :—and A. W. TAWNEY.

**H. C.**—D. CRAWLEY, R.S.S. :—T. DAVIES, R.S.S. :—and J. S. SANDERS.

**C.**—J. BONNY :—G. W. BRIDGES :—F. GODDARD :—W. MARSHALL :—and J. REECE.

(Three Prizes were also given by the County Councils of Kent and Surrey in Class 192, for Competitors who had attended any of the Farriery Classes held in connection with the South Eastern Agricultural College.)

**I. (£3).**—A. W. TAWNEY.

**II. (£2).**—J. BONNY.

**III. (£1).**—G. W. BRIDGES.

**R. & H. C.**—W. JONES.

**CLASS 193.**—*Best Shoeing of a Horse on the fifth day of the Show, by a Smith, under twenty-five years of age. (Competitors in this Class were required to declare their age at the time of entry, and also to state whether they wished to shoe a Nag or a Cart Horse.)* [9 entries.]

**I. (£4).**—R. COX.

**II. (£3).**—D. EVANS.

**III. (£2).**—R. SPARROW.

**IV. (£1).**—W. T. REEVE.

**R.**—A. BAKER.

**CLASS 194.**—*Best Shoeing of a Horse on the fifth day of the Show, by a previous winner of one of the Society's First Prizes or a Champion Prize at any other Society's Show.* [10 entries.]

**I. (£5).**—S. THOMPSON.

**R.**—J. MARTIN.

## POULTRY.

**CLASS 1.**—COCHIN, COCK. [6 entries.]

**I. (£1 10s.).**—CORNISH AND SON.

**II. (15s.).**—R. HOLLAND.

**III. (10s.).**—J. A. SLATTER.

**R.**—H. DICKSON.

**H. C.**—MRS. RADCLYFFE.

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## CLASS 2.—COCHIN, HEN. [6 entries.]

- I. (£1 10s.)—R. HOLLAND.
- II. (15s.)—G. DOBLE.
- III. (10s.)—CORNISH AND SON.
- R.—Mrs. RADCLYFFE.
- H. C.—H. DICKSON.

## CLASS 3.—BRAHMA, COCK. [7 entries.]

- I. (£1 10s.)—R. HOLLAND.
- II. (15s.)—R. W. WEBSTER.
- III. (10s.)—G. W. HENSHALL.
- R.—J. C. TOZER.
- V. H. C.—S. W. THOMAS.
- H. C.—H. E. BUSH.
- C.—J. A. SLATTER.

## CLASS 4.—BRAHMA, HEN. [5 entries.]

- I. (£1 10s.)—R. W. WEBSTER.
- II. (15s.)—G. W. HENSHALL.
- R.—R. HOLLAND.
- V. H. C.—R. W. WEBSTER.
- C.—S. W. THOMAS.

## CLASS 5.—LANGSHAN, COCK. [7 entries.]

- I. (£1 10s.)—W. H. CRANE.
- II. (15s.)—W. H. CRANE.
- III. (10s.)—G. FIELDER.
- R.—J. R. R. MITCHELL.
- C.—A. S. HISCOCK :—and C. SEABROOKE.

## CLASS 6.—LANGSHAN, HEN. [8 entries.]

- I. (£1 10s.)—G. FIELDER.
- II. (15s.)—C. SEABROOKE.
- III. (10s.)—A. S. HISCOCK.
- R.—J. W. WALKER.
- V. H. C.—Rev. R. CHICHESTER.
- C.—W. H. CRANE :—and Dr. F. RUTHERFOORD HARRIS.

**CLASS 7.—PLYMOUTH ROCK, COCK. [7 entries.]**

**I. (£1 10s.)—Lady M. STRANGWAYS.**

**II. (15s.)—W. E. DAINTON.**

**III. (10s.)—A. THOMAS.**

**R.—G. DAY.**

**V. H. C.—ABBOTT BROS.:—and E. J. W. MATTHEWS.**

**CLASS 8.—PLYMOUTH ROCK, HEN. [7 entries.]**

**I. (£1 10s.)—W. E. DAINTON.**

**II. (15s.)—Lady M. STRANGWAYS.**

**III. (10s.)—J. N. JACKMAN.**

**R.—E. J. W. MATTHEWS.**

**V. H. C.—A. G. RICH.**

**C.—J. B. BOTTERILL.**

**CLASS 9.—WYANDOTTE, COCK. [14 entries.]**

**I. (£1 10s.)—H. F. LOCKE KING.**

**II. (15s.)—TAYLOR BROS.**

**III. (10s.)—T. FAWKES.**

**R.—H. PICKLES.**

**V. H. C.—ABBOTT BROS.:—M. G. GOLDSMITH:—W. H. HUNT:—C. PRESTON:—and H. QUICK.**

**C.—P. L. A. PRICE.**

**CLASS 10.—WYANDOTTE, HEN. [12 entries.]**

**I. (£1 10s.)—H. PICKLES.**

**II. (15s.)—H. QUICK.**

**III. (10s.)—P. L. A. PRICE.**

**R.—D. E. TAYLOR.**

**V. H. C.—W. H. HUNT:—and H. F. LOCKE KING.**

**H. C.—C. PRESTON.**

**C.—BRENT POULTRY FARM:—and W. H. HUNT.**

**CLASS 11.—ORPINGTON, COCK. [15 entries.]**

**I. (£1 10s.)—W. COOK AND SONS.**

**II. (15s.)—T. FAWKES.**

**III. (10s.)—W. H. CORNISH.**

**R.—A. S. HISCOCK.**

**V. H. C.—ABBOTT BROS.:—T. DIXON:—and R. DE C. PEELE.**

**H. C.—H. DICKSON.**

**C.—T. DIXON.**

CLASS 12.—ORPINGTON, HEN. [13 entries.]

- I. (£1 10s.)**—R. DE C. PEELE.
- II. (15s.)**—W. H. CORNISH.
- III. (10s.)**—HALLAM and CUDWORTH.
- R.**—W. COOK AND SONS.
- V. H. C.**—W. BETTS AND SON:—H. DICKSON:—and A. S. HISCOCK.
- C.**—A. S. HISCOCK.

CLASS 13.—MINORCA, COCK. [6 entries.]

- I. (£1 10s.)**—FURLAND BROS.
- II. (15s.)**—A. G. PITTS.
- III. (10s.)**—E. C. SOUTHWOOD.
- R.**—A. G. PITTS.
- V. H. C.**—J. W. CROSSMAN.

CLASS 14.—MINORCA HEN. [9 entries.]

- I. (£1 10s.)**—A. G. PITTS.
- II. (15s.)**—J. RISDON.
- III. (10s.)**—FURLAND BROS.
- R.**—A. G. PITTS.
- V. H. C.**—T. C. PLOWMAN.
- H. C.**—E. C. SOUTHWOOD.
- C.**—J. W. CROSSMAN.

CLASS 15.—LEGHORN, COCK. [3 entries.]

- II. (15s.)**—STANBURY BROS.
- R.**—F. W. WESTRAY.

CLASS 16.—LEGHORN, HEN. [7 entries.]

- I. (£1 10s.)**—STANBURY BROS.
- II. (15s.)**—D. E. TAYLOR.
- III. (10s.)**—Rev. R. CHICHESTER.
- R.**—C. F. BANNISTER.
- H. C.**—A. C. GILBERT.

CLASS 17.—HAMBURG, COCK. [6 entries.]

- I. (£1 10s.)**—G. DOELE.
- II. (15s.)**—H. PICKLES.
- III. (10s.)**—J. CORNISH.
- R.**—J. CORNISH.
- H. C.**—Rev. S. ASHWELL.
- C.**—Viscount DEERHURST.

**CLASS 18.—HAMBURG, HEN. [5 entries.]**

- I. (£1 10s.)—G. DOBLE.**
- II. (15s.)—H. PICKLES.**
- R.—J. CORNISH.**
- V. H. C.—D. E. TAYLOR.**
- C.—D. E. TAYLOR.**

**CLASS 19.—DORKING (COLOURED), COCK. [6 entries.]**

- I. (£1 10s.)—Viscount DEERHURST.**
- II. (15s.)—H. F. and E. LOCKE KING.**
- III. (10s.)—Mrs. RADCLYFFE.**
- R.—NICHOLLS AND SONS.**

**CLASS 20.—DORKING (COLOURED), HEN. [8 entries.]**

- I. (£1 10s.)—Viscount DEERHURST.**
- II. (15s.)—H. REEVES.**
- III. (10s.)—Mrs. RADCLYFFE.**
- R.—W. STANFORD.**
- H. C.—P. POLENGHI.**

**CLASS 21.—DORKING (SILVER GREY), COCK. [8 entries.]**

- I. (£1 10s.)—Viscount DEERHURST.**
- II. (15s.)—H. REEVES.**
- III. (10s.)—Hon. F. AMHERST.**
- R.—Viscount DEERHURST.**
- H. C.—P. POLENGHI.**
- C.—H. REEVES:—and Mrs. SPERLING.**

**CLASS 22.—DORKING (SILVER GREY), HEN. [4 entries.]**

- I. (£1 10s.)—H. REEVES.**
- II. (15s.)—H. REEVES.**
- R.—Viscount DEERHURST.**
- H. C.—Hon. F. AMHERST.**

**CLASS 23.—DORKING (WHITE OR CUCKOO), COCK. [5 entries.]**

- I. (£1 10s.)—A. J. TAYLOR.**
- II. (15s.)—P. LEE.**
- J. J. G. WOODCOCK.**
- V. H. C.—A. J. TAYLOR.**

**CLASS 24.—DORKING (WHITE OR CUCKOO), HEN. [5 entries.]**

- I. (£1 10s.)—P. LEE.**  
**II. (15s.)—J. J. G. WOODCOCK.**  
**R.—A. J. TAYLOR.**  
**H. C.—S. W. BENNETT.**  
**C.—A. J. TAYLOR.**

**CLASS 25.—OLD ENGLISH GAME, COCK. [4 entries.]**

- II. (15s.)—Col. E. C. A. SANFORD.**

**CLASS 26.—OLD ENGLISH GAME, HEN. [6 entries.]**

- I. (£1 10s.)—E. BARNES.**  
**II. (15s.)—W. STANFORD.**  
**III. (10s.)—J. D. T. PARSONS.**  
**R.—J. D. T. PARSONS.**

**CLASS 27.—INDIAN GAME, COCK. [5 entries.]**

- I. (£1 10s.)—Miss A. FRAYN.**  
**II. (15s.)—E. W. T. HOARE.**  
**R.—C. RADFORD.**  
**H. C.—H. J. GIBBS.**

**CLASS 28.—INDIAN GAME, HEN. [4 entries.]**

- I. (£1 10s.)—E. MARSHALL.**  
**II. (15s.)—E. MARSHALL.**  
**R.—H. J. GIBBS.**

**CLASS 29.—MALAY, COCK. [2 entries.]**

- I. (£1 10s.)—J. FRAYN.**  
**R.—R. DE C. PEELE.**

**CLASS 30.—MALAY, HEN. [3 entries.]**

- I. (£1 10s.)—J. FRAYN.**  
**R.—A. W. PHILPOTT.**

**CLASS 31.—FRENCH, COCK. [5 entries.]**

- I. (£1 10s.)—S. W. THOMAS.**  
**II. (15s.)—P. LEE.**  
**R.—J. HILL.**  
**C.—J. B. BOTTEBILL.**

CLASS 32.—FRENCH, HEN. [5 entries.]

I. (£1 10s.)—S. W. THOMAS.

II. (15s.)—P. LEE.

R.—SOUTH-EASTERN AGRICULTURAL COLLEGE.

CLASS 33.—ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), COCK. [3 entries.]

I. (£1 10s.)—MISS D. C. FREW, *Ascel*.

II. (15s.)—G. DOBLE, *Spanish*.

CLASS 34.—ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), HEN. [1 entry.]

II. (15s.)—G. DOBLE, *Spanish*.

CLASS 35.—COCHIN, BRAHMA, LANGSHAN, PLYMOUTH ROCK, WYANDOTTE, OR ORPINGTON, COCKEREL. [7 entries.]

I. (£1 10s.)—R. HOLLAND, January 3.

II. (15s.)—BRENT POULTRY FARM, *Orpington*.

III. (10s.)—M. G. GOLDSMITH, *Wyandotte*, January 2.

R.—S. W. THOMAS, *Brahma*, January 19.

V. H. C.—W. H. CORNISH, *Orpington*, February 28.

CLASS 36.—COCHIN, BRAHMA, LANGSHAN, PLYMOUTH ROCK, WYANDOTTE, OR ORPINGTON, PULLET. [8 entries.]

I. (£1 10s.)—S. W. THOMAS, *Brahma*, January 19.

II. (15s.)—T. FAWKES, January 10.

III. (10s.)—R. HOLLAND, January 5.

R.—M. G. GOLDSMITH, *Wyandotte*, January 2.

V. H. C.—J. R. R. MITCHELL, *Orpington*.

H. C.—BRENT POULTRY FARM.

CLASS 37.—MINORCA, LEGHORN, HAMBURG, OR FRENCH, COCKEREL. [8 entries.]

I. (£1 10s.)—S. W. THOMAS, *French*, January 26.

II. (15s.)—J. CORNISH, *Hamburg*, January 4.

III. (10s.)—J. CORNISH, January 14.

R.—J. HILL, *Houdan*, January 10.

V. H. C.—T. FAWKES, January 15.

C.—J. W. BROWN, *Leghorn*, January 1:—and G. DOBLE, *Hamburg*, January 3.

**CLASS 38.—MINORCA, LEGHORN, HAMBURG, OR FRENCH, PULLET.**  
[7 entries.]

**I. (£1 10s.)**—J. CORNISH, *Hamburg*, January 4.

**II. (15s.)**—S. W. THOMAS, *French*, January 26.

**III. (10s.)**—G. DOBLE, *Hamburg*, January 3.

**R.**—J. HILL, *Houdan*, January 10.

**CLASS 39.—DORKING, GAME, MALAY, OR ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), COCKEREL.** [9 entries.]

**I. (£1 10s.)**—H. F. and E. LOCKE KING, *Dorking*, January 2.

**II. (15s.)**—Miss A. FRAYN, *Indian Game*.

**III. (10s.)**—Miss D. C. FREW, *Malay*, January 25.

**R.**—W. G. WATSON, *Dorking*, January 16.

**H. C.**—Mrs. J. HEBDITCH, *Dorking*, January 2.

**C.**—H. REEVES, *Dorking*, January 1.

**CLASS 40.—DORKING, GAME, MALAY, OR ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), PULLET.** [6 entries.]

**I. (£1 10s.)**—Miss A. FRAYN, *Indian Game*.

**II. (15s.)**—H. REEVES, *Dorking*, January 1.

**III. (10s.)**—G. DOBLE, *Spanish*, January 2.

**R.**—G. J. MAY, *Indian Game*, January 14.

**H. C.**—H. F. and E. LOCKE KING, *Dorking*, January 2.

**LIVE TABLE POULTRY.**

**CLASS 41.—PAIR OF COCKERELS OF ANY PURE BREED.**  
[4 entries.]

**I. (£1 10s.)**—H. REEVES, *Dorkings*, January 1.

**II. (15s.)**—G. J. MAY, *Indian Game*, January 14.

**C.**—J. R. R. MITCHELL.

**CLASS 42.—PAIR OF PULLETS, OF ANY PURE BREED.**  
[5 entries.]

**I. (£1 10s.)**—J. FRAYN, *Indian Game*.

**II. (15s.)**—H. REEVES, *Dorkings*, January 1.

**R. & H. C.**—J. R. R. MITCHELL.

**H. C.**—G. J. MAY, *Indian Game*, January 14.

**CLASS 43.—PAIR OF COCKERELS OF A FIRST CROSS FROM ANY PURE BREEDS.** [3 entries.]

**I. (£1 10s.)**—J. R. R. MITCHELL.

**II. (15s.)**—J. R. R. MITCHELL.

**CLASS 44.—PAIR OF PULLETS OF A FIRST CROSS FROM ANY PURE BREEDS. [3 entries.]**

**I. (£1 10s.)**—W. HAMBLY, *Indian-Game-Dorking*, January 5.

**II. (15s.)**—J. R. R. MITCHELL.

**SELLING CLASSES.**

**CLASS 45.—ANY DISTINCT BREED, COCK (PRICE NOT TO EXCEED £1 1s.). [10 entries.]**

**I. (£1 10s.)**—Viscount DEERHURST.

**II. (15s.)**—W. H. CORNISH, *Orpington*.

**III. (10s.)**—S. W. THOMAS.

**R. & H. C.**—H. F. and E. LOCKE KING, *Indian Game*.

**H. C.**—CORNISH and SON.

**C.**—G. DOBLE :—HALLAM and CUDWORTH, *Orpington* :—and F. W. WESTRAY, *Wyandotte*.

**CLASS 46.—ANY DISTINCT BREED, HEN (PRICE NOT TO EXCEED £1 1s.). [6 entries.]**

**I. (£1 10s.)**—W. H. CORNISH, *Orpington*.

**II. (15s.)**—Miss A. FRAYN, *Indian Game*.

**III. (10s.)**—CORNISH and SON.

**R. & H. C.**—G. DOBLE.

**SPECIAL PRIZES.**

(Given by Captain J. C. Best.)

**CLASS 47.—ANY DISTINCT BREED, COCK AND FOUR HENS, Bred in 1900 or 1901, the Property of one Exhibitor. [13 entries.]**

**I. (£5.)**—Viscount DEERHURST.

**II. (£3.)**—STANBURY BROS., *Leghorns*.

**III. (£2.)**—J. R. R. MITCHELL, *Dorkings*.

**R.**—T. JARVIS, *Indian Game*.

**V. H. C.**—W. COOK and SONS, *Orpingtons* :—P. CROMACK, *Orpingtons* :—R. HOLLAND :—and SOUTH-EASTERN AGRICULTURAL COLLEGE, *Faverolles*.

**H. C.**—J. D. T. PARSONS, *Old English Game* :—and J. M. STOCKBRIDGE, *Poland*.

**C.**—T. FAWKES :—and O. PHILLIPS, *Wyandottes*.

**DUCKS, GEESE, AND TURKEYS.**

**CLASS 48.—DRAKE OR DUCK (AYLESBURY). [3 entries.]**

**I. (£1 10s.)**—F. READ.

## CLASS 49.—DRAKE OR DUCK (ROUEN). [4 entries.]

I. (£1 10s.)—J. R. R. MITCHELL.

II. (15s.)—W. G. WATSON.

## CLASS 50.—DRAKE OR DUCK (PEKIN). [6 entries.]

I. (£1 10s.)—J. R. R. MITCHELL.

II. (15s.)—F. A. MILES.

III. (10s.)—O. PHILLIPS.

R.—A. S. HISCOCK.

## CLASS 51.—GANDER. [3 entries.]

I. (£1 10s.)—ABBOTT BROS.

II. (15s.)—HON. S. AMHERST.

H. C.—J. R. R. MITCHELL.

## CLASS 52.—GOOSE. [3 entries.]

I. (£1 10s.)—HON. S. AMHERST.

II. (15s.)—W. E. DAINTON.

## CLASS 53.—TURKEY, COCK. [5 entries.]

I. (£1 10s.)—Dr. F. RUTHERFOORD HARRIS.

II. (15s.)—A. S. HISCOCK.

R.—H. G. REW.

V. H. C.—ABBOTT BROS. :—and J. R. R. MITCHELL.

## CLASS 54.—TURKEY, HEN. [3 entries.]

I. (£1 10s.)—ABBOTT BROS.

II. (15s.)—W. STANFORD.

H. C.—ABBOTT BROS.

**DEAD TABLE POULTRY.***(Forwarded alive, and killed and plucked by a Poulterer acting for the Society.)*CLASS 55.—PAIR OF COCKERELS OF ANY PURE BREED.  
[7 entries.]

I. (£1 10s.)—J. R. R. MITCHELL.

II. (15s.)—SOUTH-EASTERN AGRICULTURAL COLLEGE, *Dorking* January.

III. (10s.)—J. R. R. MITCHELL.

R.—J. R. R. MITCHELL.

H. C.—MRS. G. TWINING, *Orpington*, January 1.C.—H. REEVES, *Dorking*, January 12.

CLASS 56.—PAIR OF PULLETS OF ANY PURE BREED.  
[7 entries.]

- I. (£1 10s.)—H. REEVES, January 12.
- II. (15s.)—J. R. R. MITCHELL.
- III. (10s.)—E. MARSHALL, *Indian Game*, January 5.
- R.—J. R. R. MITCHELL.
- H. C.—J. R. R. MITCHELL.

CLASS 57.—PAIR OF COCKERELS OF A FIRST CROSS FROM ANY  
PURE BREEDS. [3 entries.]

- I. (£1 10s.)—J. R. R. MITCHELL.
- II. (15s.)—J. R. R. MITCHELL.
- R.—J. R. R. MITCHELL.

CLASS 58.—PAIR OF PULLETS OF A FIRST CROSS FROM ANY  
PURE BREEDS. [8 entries.]

- I. (£1 10s.)—Mrs. G. TWINING, *Orpington-Indian Game*, January 5.
- II. (15s.)—W. HAMBLY, *Indian Game-Dorking*, January 5.
- III. (10s.)—G. E. PARHAM, *Indian Game-Orpington*.
- R.—J. R. R. MITCHELL.
- V. H. C.—P. L. BENSON, M.D., *Indian Game-Orpington*, January 10 :—  
and J. R. R. MITCHELL.
- H. C.—J. R. R. MITCHELL.

(The First Prizes in Classes 59 and 60 were given by Sir W. Gilbey, Bart.)

CLASS 59.—PAIR OF CROSS-BRED COCKERELS. [4 entries.]

- I. (£1 10s.)—J. R. R. MITCHELL.
- II. (15s.)—J. R. R. MITCHELL.
- R.—J. R. R. MITCHELL.

CLASS 60.—PAIR OF CROSS-BRED PULLETS. [8 entries.]

- I. (£1 10s.)—J. R. R. MITCHELL.
- II. (15s.)—Mrs. G. TWINING, *Orpington-Indian Game*, January 5.
- III. (10s.)—W. HAMBLY, *Indian Game Dorking*, January 5.
- R.—J. R. R. MITCHELL.
- V. H. C.—Mrs. J. HERDITCH, *Faverolle-Indian Game*, January 1 :—and  
G. E. PARHAM, *Indian Game-Orpington*, January.
- H. C.—J. R. R. MITCHELL.

CLASS 61.—PAIR OF DUCKLINGS. [4 entries.]

- I. (£1 10s.)—F. READ.
  - II. (15s.)—F. READ.
-

BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.  
ART UNION HELD AT CROYDON, MAY 27, 1901.

Prize Ticket.	Value of Prize.	Prize Winner.	Winner's Address.	Name of Picture.	Artist.	Price of Picture.
£	s.					£ s. d.
1427	15 15	A. Seldon ..	{ Hazledan, Chatfield Road, Croydon .. .. . }	An Unsolved Problem ..	Fanny Moody ..	15 15 0
605	10 10	J. H. Bush ..	{ 4, Fountain Buildings, Bath .. .. . }	Near Upton, Cheshire ..	J. Barker ..	10 10 0
210	10 10	E. L. Shore ..	28, Wellesley Road, Croydon	{ Old Mill at Pines Meadow Spring on the Culm, Devon The Pool .. .. . }	W. H. Mander .. Mrs. E. A. Robson .. F. Smith ..	7 0 0 2 9 0 1 1 0
1513	10 10	T. B. Quintin ..	{ 86, Alexandra Road, Addis- combe, Surrey .. .. . }	Last Leaves .. .. .	J. E. Grace ..	5 10 0
168	10 10	W. H. Morton ..	{ Turk's Head, Exeter .. .. . }	On the River Ouse ..	J. E. Grace ..	5 0 0
1849	5 5	Miss Harley Smith	{ 101, Churchill Road, South Croydon .. .. . }	Afternoon, Countess Weir ..	J. Shapland ..	10 10 0
565	5 5	F. H. Andrews ..	{ 40, North End, Croydon .. .. . }	{ Bosham, Sussex .. .. . }	Mrs. Dakin ..	4 4 0
1418	5 5	E. Harris ..	{ Whaddon Bridge House, Croydon .. .. . }	By the Sea .. .. .	Mary May ..	1 1 0
882	5 5	F. Wright ..	{ Cheltenham .. .. . }	Behind the Village, C. Cury	D. Bates ..	5 5 0
316	5 5	Unclaimed ..	{ .. .. . }	Christmas Fare .. .. .	J. Dennis ..	5 5 0
1196	5 5	J. Allan ..	{ Aberfoyle, Duppes Hill, Croydon .. .. . }	Severn at Bewdley ..	H. Cheadle ..	5 5 0
1831	5 0	F. A. Johnson ..	{ 13, Clyde Road, Croydon .. .. . }	Feeding Time .. .. .	Violet Sells ..	5 5 0
305	5 0	J. Stewart ..	{ 25, Westow Street, Upper Norwood .. .. . }	{ In Southampton Water .. .. . }	Mrs. de Crespigny ..	4 4 0
235	5 0	G. Coventry ..	{ Fernleigh, South Norwood .. .. . }	Wanderer .. .. .	E. B. Marriott ..	1 10 0
1167	5 0	A. J. Pallant ..	{ 44, Elliscombe Road, Old Charlton .. .. . }	{ A Quiet Time .. .. . }	M. F. Burnett ..	2 10 0
954	5 0	C. J. Margetson ..	{ 11, Tantallon Road, Balham .. .. . }	{ Strawberry Ripe .. .. . }	Mrs. E. Banner ..	2 10 0
462	5 0	H. J. Seymour ..	High Street, Bedford .. .. .	Basildon-on-Thames ..	W. Ball ..	5 0 0
				Sooty Cattle .. .. .	W. V. Tippet ..	5 0 0
				On the Union, below Pont New	W. H. Mander ..	5 0 0
				On the Mass .. .. .	F. J. Allridge ..	2 12 6
				Coast Scene .. .. .	W. H. Earp ..	2 7 6
				Evening, Normandy ..	D. Watson ..	5 5 0

Prizes in Art Union.

lxxvii

803	4	4	S. R. Slade..	128, George Street, Croydon	(Violets and Primroses ..	H. Craven ..	1	5	0
1781	4	4	F. H. Henrich ..	(54, Birchanger Road, South Norwood ..	Alvaine Burn ..	E. Ward Russell ..	2	2	0
405	4	4	Miss L. L. Butler	Wells Road, Bath..	Sunset ..	F. Smith ..	0	17	0
568	4	4	F. Powell ..	4, Milton Villas, Wealdstone	A Cheshire Common ..	J. Pelham ..	4	4	0
51	4	4	A. T. Cox ..	(1, Highbury Buildings, Snow Hill, Bath ..	The Old Mill ..	W. Rossiter ..	4	4	0
1754	4	4	H. Gibbons..	(Clutton, Bristol ..	(Sketch in Savernake Forest	Miss M. May ..	2	2	0
308	3	3	J. Stewart ..	(25, Westow Street, Upper Norwood ..	Emblems of Spring ..	Miss A. Holding ..	2	2	0
418	3	3	E. Sharland ..	(97, Berkeley Road, Bishops-ton, Bristol ..	Scene near Balls ..	J. Barker ..	4	4	0
1675	3	3	H. J. Coleman ..	77, Edridge Road, Croydon ..	Snowdon from Capol ..	W. H. Hall ..	4	4	0
1271	3	3	J. Panniers..	28, Southwark Street, London	Loch Earn ..	H. S. Jackson ..	3	3	0
725	3	3	W. H. Wilcox ..	Palgrave, Diss ..	Barges, Mouth of Thames ..	W. A. Thornbery ..	3	3	0
1786	3	3	W. Clarke ..	24, Lausdown Road, Croydon	By the Quayside ..	Both Amore ..	3	3	0
593	2	2	E. Spencer ..	Easton Royal, Pawsey ..	(Ruswarp, Yorks ..	Mrs. E. Bonner ..	1	11	6
1573	2	2	Miss E. Follett	120, Caversham Road, Reading	Near Dordrecht, Holland ..	Mrs. E. Bonner ..	1	11	6
792	2	2	J. E. Kistruck ..	Wildcombe, Bath ..	Leather Tor ..	W. S. Morrish ..	3	3	0
449	2	2	Mrs. Sartain ..	(85, Forest Road, Forest Gate, E..	A Quiet Corner ..	Violet M. Read ..	2	2	0
518	2	2	A. B. Coulter ..	105, Oval Road, Croydon ..	Sunset ..	F. Hines ..	2	2	0
487	2	2	W. Paine ..	(97, Berkeley Road, Bishops-ton, Bristol ..	Low Water ..	E. Laro ..	2	2	0
1676	2	2	H. J. Coleman ..	Bushy Lodge, Teddington ..	Roses ..	H. Craven ..	2	2	0
811	2	2	N. Braby ..	May Cottage, Nailsea ..	Evening ..	F. Hines ..	2	2	0
467	2	2	Mrs. Aish ..		At Bosham ..	J. E. Grace ..	2	2	0
					After Rain ..	Mrs. Hayward ..	2	2	0
					Violet Eyes that Dream	Miss B. Tickell ..	2	2	0
					Pines ..	W. Rossiter ..	2	2	0
					Previous Year.				
1745	5	5	J. S. Moore..	25, Doveton Road, Croydon..	Innkeeper's Daughter ..	Mrs. Chamberlain..			..

By Order THOS. F. FLOWMAN,  
4, Terrace Walk, Bath.

June 25th, 1901.

## Bath and West and Southern Counties Society.

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### OBJECTS OF THE SOCIETY AND PRIVILEGES OF MEMBERSHIP.

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#### ANNUAL EXHIBITIONS.

The Society annually holds an Exhibition in some city or town in England or Wales. Each section of the Society's district is visited at intervals, so that most Members have an opportunity of seeing the Show in their own neighbourhood every few years. Prizes to a large amount are given for Horses, Cattle, Sheep, Pigs, Farm Produce, &c. Provision is also made for the exhibition of Agricultural Implements and Machinery, Seeds, Cattle Foods, Artificial Manures, and articles of general utility. A substantially-built and completely-equipped Working-Dairy on a large scale is a special feature of these Exhibitions. Here explanatory demonstrations, and comparative tests of implements and processes are carried on with the assistance of well-known practical and scientific experts, and Butter-making Competitions are held. Among other features of the Annual Meeting are Shoeing and Milking Competitions, Poultry and Horticultural Shows, and Exhibitions illustrative of Bee-keeping, Home Industries, Art-Manufactures, and the Sciences connected with Agriculture and Horticulture.

*Membership entitles to free admission to the Annual Exhibition, and also to the Grand Stand overlooking the Horse and Cattle Ring, to the Reserved Seats in the Working Dairy, and to the use of the Members' Special Pavilion for Reading, Writing, &c.*

*Entries can be made by Members (elected on or before the last Tuesday in January preceding the Show) at 10s. per entry for Horses (other than in the Jumping and Harness Classes), and 5s. per entry for Cattle, Sheep, and Pigs. Non-Members are required to pay £1 per entry for Horses (other than in the Jumping and Harness Classes) and 15s. per entry for the other Stock named. Similar reductions in the Fees in the Farm Produce, the Poultry, and other Classes are made to Members.*

#### THE JOURNAL.

*All Members receive free of charge the Society's Journal, which is published annually, bound in cloth. It has for its aim the dissemination of agricultural knowledge in a popular form, and in addition to original articles by well-known agricultural authorities, it contains particulars of the Society's general operations, full reports of its experimental and research work, prize awards, financial statements, lists of Members, reviews of new books on agriculture, &c. (The price of the Journal to non-Members is 6s. 4d. post free.)*

#### CHEMICAL AND BOTANICAL FACILITIES.

The Society has a Consulting Chemist (Dr. J. A. Voelcker, M.A., F.I.C., &c.), and a Consulting Botanist (Mr. W. Carruthers, F.R.S.), from whom Members can obtain analyses and reports at reduced rates of charge.

#### EXPERIMENTS.

Experiments on Crops are conducted at experimental stations in various parts of the kingdom, and Members are enabled to take part in these and to receive reports thereon.

The Society has also an experimental station and laboratory attached to its Cheese School, and a similar department for carrying on researches in connection with Cider-making. At both stations systematic investigations are conducted by a scientific staff, acting in conjunction with practical experts, *detailed reports of which are furnished to Members.*

#### TECHNICAL EDUCATION.

The Society conducts, on behalf of the Somerset County Council, a Cheese School, where Students are received and boarded. *Members are admitted free to witness the Teaching and Competitions at any of the Society's Schools.*

#### ART.

One of the objects for which the Society was founded was the encouragement of Arts as well as Agriculture, and, to this end, exhibitions of Art-Manufactures and of work representative of Arts and Handicrafts, executed by pupils attending classes in connection with Technical Education Committees, Schools of Art, and other public bodies, are annually held.

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#### TERMS OF MEMBERSHIP.

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##### ANNUAL SUBSCRIPTIONS.

Ordinary Members, not less than .. .. .	£1
Tenant Farmers, the rateable value of whose holdings does not exceed £200 a-year, not less than .. .. .	10/-

Governors, who are eligible for election as President or Vice-President, and who subscribe not less than £2, are entitled, in addition to the privileges already mentioned, to an extra Season Ticket for the Annual Exhibition and to the Grand Stand, &c. Governors subscribing more than £2 are entitled to a further Ticket for every additional £1 subscribed.

Members subscribing less than £1 are entitled to all the privileges of Membership except that of entering Stock at reduced fees, and their admission Ticket for the Annual Show is available for *one day only* instead of for the whole time of the Exhibition.

##### LIFE COMPOSITIONS.

Governors may compound for their Subscriptions for future years by payment, in advance, of £20; and Members by payment, in advance, of £10. Governors and Members who have subscribed for 20 years may become Life-Members on payment of half these amounts.

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Any person desirous of joining the Society can be proposed by a Member, or by

THOS. F. PLOWMAN,  
Secretary and Editor,

4, Terrace Walk, Bath.

Telegraphic Address :—"PLOWMAN, BATH."

## Bath and West and Southern Counties Society.

### GENERAL LAWS,

*As revised in accordance with the Report of a Special Committee; which Report was received and adopted by the Annual General Meeting of Members, held on May 30, 1895*

### COMPOSITION OF THE SOCIETY.

I. The Society shall consist of a President, Vice-Presidents, Trustees, Council Treasurer, Secretary, and Members.

### OBJECTS.

II. The Society shall have the following objects:—

- a. To hold Exhibitions of breeding stock, agricultural implements, and such other articles connected with agriculture, arts, manufactures or commerce as may be determined upon by the Council.
- b. To conduct practical and scientific investigations in agriculture.
- c. To promote technical education in agriculture by providing means of systematic instruction.
- d. To publish a Journal for circulation.

### SUBSCRIPTIONS.

III. The Annual Subscriptions for Members shall be as follows:—

Governors (who are eligible for election as President or Vice-President) not less than	.. .. .	£2
Ordinary Members, not less than	.. .. .	£1
Tenant Farmers (the rateable value of whose holdings does not exceed £200 a-year) not less than	.. .. .	10/-

IV. The payment of £20 in one sum shall constitute a Governor for life, and of £10 in one sum an Ordinary Member for life; but any Governor who has subscribed not less than £2 annually for a period of twenty years may become a Life Governor on the further payment of £10 in one sum; and any Ordinary Member, who has subscribed not less than £1 annually for the same period, may become a Life-Member on the further payment of £5 in one sum.

V. Subscriptions shall become due and be payable in advance on the 1st of January in each year or as soon as the Subscriber has been elected a Member. When the election takes place during the last quarter of the year the subscription payable on election will be considered as applying to the ensuing year.

VI. A Member shall be liable to pay his subscription for the current year unless he shall have given notice, in writing, to the Secretary before January 1st of his intention to withdraw.

### GOVERNING BODY.

VII. The entire management of the Society—including the making of By-laws, election of Members, determining the Prizes to be awarded, appointing Committees, fixing the Places of Meetings and Exhibitions, appointing or removing the Treasurer, Secretary, and such other officers as may be required to carry on

the business of the Society—shall be vested in the Council, who shall report its proceedings at the Annual Meetings of the Society.

VIII. The Council shall consist of the Patron (if any), President, Vice-Presidents, Trustees, and Treasurer (who shall be *ex-officio* Members), and of sixty-six elected Members.

**ELECTION OF PRESIDENT, VICE-PRESIDENTS, TRUSTEES, AND COUNCIL.**

IX. The election of a President for the year, of any additional Vice-President, of Trustees, and of the Members of Council representing the Divisions named in Law X., shall take place at the Annual Meeting of the Society, and they shall enter into office at the conclusion of the Exhibition during which such Annual Meeting has been held.

X. The sixty-six Members of the Council referred to in Laws VIII and IX. shall consist of fifty-eight persons residing or representing property in the following Divisions, viz. :—

Twelve from the Counties of Devon and Cornwall, which shall be called the Western Division;

Twenty-four from the Counties of Somerset, Dorset, and Wilts, which shall be called the Central Division;

Twelve from the Counties of Hants, Berks, Oxon, Bucks, Middlesex, Surrey, Sussex, and Kent, which shall be called the Southern Division; and

Ten from the Counties of Worcester, Gloucester, Hereford and Monmouth, and the Principality of Wales, which shall be called the North-Western Division.

The remaining eight shall be elected (irrespective of locality) from the general body of Members, and shall form a Division which shall be called the "Without Reference to District" Division.

XI. One half of the elected Members in each of the five Divisions named in Law X. shall retire annually by rotation, but shall be eligible for re-election.

XII. The Council shall have power to nominate a President, Vice-Presidents, Trustees, and Members of Council for the approval of the annual meeting, and to fill up such vacancies in their own body as are left after the annual meeting, or as may from time to time occur during the interval between the annual meetings.

XIII. Nominations to offices, election to which is vested in the whole body of Members, must reach the Secretary ten days before the meeting at which such vacancies are to be filled up.

**MEETINGS.**

XIV. The Annual Meeting of the Society shall take place during the holding of the annual Exhibition.

XV. Special general meetings of the Society may be convened by the President on the written requisition of not less than three Members of Council; and all Members shall have ten days' notice of the object for which they are called together.

XVI. No Member of less than three months' standing, or whose subscription is in arrear, shall be entitled to vote at a meeting.

**EXHIBITIONS.**

XVII. The annual Exhibitions of the Society shall be held in different Cities or Towns in successive years.

XVIII. All Exhibitors shall pay such fees as may be fixed by the Council. Members subscribing not less than £1 per annum, who have been elected previous to February 1st, and have paid the subscription for the current year, shall be entitled to exhibit at such reduction in these fees as the Council shall determine.

**PRIZES.**

XIX. All prizes offered at the cost of the Society shall be open for competition to the United Kingdom.

XX. No person intending to compete for any prize offered at the annual Exhibition shall be eligible to act as a judge or to have any voice in the selection of judges to award the premiums in the department in which he exhibits.

XXI. If it be proved to the satisfaction of the Council that any person has attempted to gain a prize in this, or in any other Society, by a false certificate or by a misrepresentation of any kind, such person shall thereupon be for the future excluded from exhibiting in this Society.

**JOURNAL.**

XXII. The Proceedings of the Society, Awards of Prizes, Financial Statements, and List of Officers, Governors and Members shall be printed annually in the Society's Journal, and every Governor and Member, not in arrear with his subscription, shall be entitled to receive one copy, free of expense, and there shall be an additional number printed for sale.

**POLITICS.**

XXIII. No subject or question of a political tendency shall be introduced at any meeting of this Society.

**ALTERATIONS IN LAWS.**

XXIV. No new General Law shall be made or existing one altered, added to or rescinded, except at an annual or special general meeting, and then only provided that a statement of particulars, in writing, shall have been sent to the Secretary at least twenty-one days previous to the meeting at which the question is to be considered.

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## List of Officers.

1901-1902.

### PLYMOUTH MEETING.

#### PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

#### PRESIDENT FOR 1901-1902.

THE RIGHT HON. THE EARL OF MORLEY.

#### TRUSTEES.

- PAGET, THE RIGHT HON. SIR RICHARD HORNER, Bart., Cranmore Hall,  
Shepton Mallet.  
\*CLINTON, THE RIGHT HON. THE LORD, Heanton Satchville, Dolton,  
N. Devon.  
\*BATH, THE MOST HON., THE MARQUESS OF, Longleat, Warminster.

#### VICE-PRESIDENTS.

- |                                      |                                  |
|--------------------------------------|----------------------------------|
| *WALES, H.R.H. PRINCE OF             | Sandringham, Norfolk             |
| ACLAND, SIR C. T. D., Bart.          | Killerton, Exeter                |
| *AMHERST, EARL                       | Montreal, Sevenoaks, Kent        |
| *BATH, MARQUESS OF                   | Longleat, Warminster             |
| BEAUFORT, DUKE OF                    | Badminton, Chippenham            |
| BEST, CAPT. J. C., R.N.              | Vivod, Llangollen                |
| BRYMER, W. E., M.P.                  | Ilington House, Dorchester       |
| *CLARENDON, EARL OF                  | The Grove, Watford [Devon        |
| *CLINTON, LORD                       | Heanton Satchville, Dolton, N.   |
| *CORK AND ORREERY, EARL OF           | Marston, Frome [Exeter           |
| *COVENTRY, EARL OF                   | Croome Court, Severn Stoke, Wor- |
| DAW, R. R. M.                        | Spurbarne, Exeter                |
| DEVONSHIRE, DUKE OF, K.G.            | Chatsworth, Derbyshire           |
| DIGBY, G. D. W.                      | Sherborne Castle, Sherborne      |
| *DUCIE, EARL OF                      | Tortworth, Falfeld, R.S.O.       |
| FITZHARDINGE, THE LORD               | Cranford, Hounslow               |
| GIBBS, A.                            | Tyntesfield, Bristol             |
| GORING, REV. J.                      | Wiston Park, Steyning            |
| *ILCHESTER, EARL OF                  | Melbury, Dorchester              |
| *JERSEY, EARL OF                     | Middleton Park, Bicester, Oxon.  |
| JONES, H. P.                         | Beaufort House, Winchester       |
| *LANSDOWNE, MARQUESS OF, K.G.        | Bowood, Calne                    |
| *LLEWELYN, SIR J. T. D., Bart.       | Penllergare, Swansea             |
| *LOPES, THE RIGHT HON. SIR M., Bart. | Maristow, Roborough, S. Devon    |
| MARLBOROUGH, DUKE OF                 | Blenheim Palace, Woodstock       |
| MILDMAY, SIR H. ST. JOHN, Bart.      | Dogmersfield Park, Winchester    |
| *MONTAGU OF BEAULIEU, LORD           | Palace House, Beaulieu, Hants    |
| MOORE-STEVENS, J. C.                 | Winscott, Great Torrington       |

\* Those to whose names an asterisk (\*) is prefixed have filled the office of President.

VICE-PRESIDENTS—*continued.*

MORETON, LORD. . . . .	Sarsden House, Chipping Norton
*MORLEY, EARL OF . . . . .	Sultram, Plympton, Devon
MORRELL, G. HERBERT, M.P. . . . .	Headington Hill Hall, Oxford
*MOUNT-EDGCUMBE, EARL OF . . . . .	Mount Edgcumbe, Devonport
NEVILLE-GRENVILLE, R. . . . .	Butleigh Court, Glastonbury
NORTHUMBERLAND, DUKE OF . . . . .	Albury Park, Guildford
*ONSLOW, EARL OF . . . . .	7, Whitehall Place, London, S.W.
PAGET, THE RIGHT HON. SIR R. H., Bart. . . . .	Cranmore Hall, Shepton Mallet
POLTIMORE, LORD . . . . .	Poltimore, Exeter
*PORTMAN, VISCOUNT . . . . .	Bryanston, Blandford
PORTAL, MELVILLE . . . . .	Laverstock House, Micheldever, Hants
SAINT GERMAN, EARL OF . . . . .	Port Elliot, Devonport
SANDERS, E. J. . . . .	Stoke House, Exeter
SOMERSET, DUKE OF . . . . .	Maiden Bradley, Bath
STORY-MASKELYNE, N., F.R.S. . . . .	Basnett Down House, Swindon
*TEMPLE, EARL . . . . .	Newton Park, Bath.
THYNNE, LORD HENRY . . . . .	Muntham, Worthing
*TREDGAR, LORD . . . . .	Tredgar Park, Newport, Monmouth
*TREMAYNE, JOHN . . . . .	Heligun, St. Austell
WALBROND, RIGHT HON. SIR W. H., Bart., M.P. . . . .	Bradfield, Cullompton
*WARWICK, EARL OF . . . . .	Warwick Castle
WILLIAMS, E. W. . . . .	Herrington, Dorchester
*WINDSOR, LORD. . . . .	Hewell Grange, Bromsgrove

THE LORD WARDEN OF THE STANNARIES.

THE SURVEYOR-GENERAL OF THE DUCHY OF CORNWALL.

THE RECEIVER-GENERAL OF THE DUCHY OF CORNWALL.

\*.\* Those to whose names an asterisk (\*) is prefixed have filled the office of President.

## MEMBERS OF COUNCIL.

## EX-OFFICIO MEMBERS.

THE PATRON.  
THE PRESIDENT.  
THE VICE-PRESIDENTS.

THE TREASURER.  
THE CONSULTING SURVEYOR.

## ELECTED MEMBERS.

## WESTERN DIVISION (DEVON AND CORNWALL).

(12 Representatives.)

## Elected in 1900:—

Name.	Address.
BUCKINGHAM, REV. The	Rectory, Doddlecombeleigh, Exeter
F. F.	
COLLINS, C. R.	Hartwell House, Exeter
MARKER, R.	Combe, Honiton
SHELLY, SIR J., Bt.	Shobrooke Park, Crediton
WILLIAMS, SIR W. R., Bart.	Heanton, Barnstaple
WYATT-EDGEHILL, COL. A.	Cowley Place, Exeter

## Elected in 1901:—

Name.	Address.
BOSCAWEN, REV. A.	Ludgvan Rectory, Long Roch, B.S.O., Cornwall
DRUMMOND, H. W.	Syon House, Budleigh, Devon
LYMOND, F. W.	21, Southernhay, West
LLEWELLYN, W. J.	Southwood, Tiverton
SILLIVANT, A. O.	Cumleigh, Stoke Canon, Exeter
VORPER, W. P.	Merafield, Plympton

## CENTRAL DIVISION (SOMERSET, DORSET, AND WILTS).

(24 Representatives.)

There are two vacancies in this Division.

ALLEN, J. D.	Springfield House, Shepton Mallet	DYKE, T.	Long Ashton Lodge, Clifton
BEST, COL. G.	Charlton House, Ludwell, Salisbury	EDWARDS, C. L. F.	The Court, Axbridge, Somerset
FOXROFT, E. T. D.	Hinton Charterhouse, Bath	FARWELL, F. G.	11, Laura Place, Bath
GIBSON, J. T.	Havet Lodge, Langford, E.S.O., Somerset	FOWLER, W. H.	Claremont, Taunton
HOMBORE, H., M.P.	Hadspen House, Castle Cary	GIBBONS, G.	Tunley Farm, near Bath
LLEWELLYN, COL. E.	Langford Court, Langford, Somerset	HALL, J. F.	Sharcombe, Wells, Somerset
MAULE, M. ST. J.	Chapel House, Bath	HETTESBURY, LORD.	Haytesbury, Wilts
NAPIER, H. B.	Long Ashton, Clifton, Bristol	NEELD, SIR A. D., Bart., C.B.	Grittleton, Chippenham
SHERSTON, MAJOR C. D.	Evercreech, Bath	RAWLENCE, E. A.	Newlands, Salisbury
SKIRNE, COL. H. M.	Warleigh Manor, Bath	SKINNER, A. C.	Pound, Bishop's Lydeard, Somerset
		SOMERVILLE, A. F.	Dinder House, Wells
		STRACHEY, SIR E., Bart., M.P.	Pensford, Somerset

## SOUTHERN DIVISION (HANTS, BERKS, OXON, BUCKS, MIDDLESEX, SURREY, SUSSEX, AND KENT).

(12 Representatives.)

DEUCK, A. F. M.	16, Queen Street, Oxford	ASHCROFT, W.	13, The Waldrons, Croydon
KNOX, C. E.	The Grange, Alresford, Hants	BENTON, J. H.	Englefield House, Reading
ROTHREFORD, J. A.	Highclere Estate Office, Newbury	BOTLER, CAPT. W. J. C.	The Elms, Taplow
STANFORD, A.	Estons, Steyning	CUNDALL, H. M., F.S.A.	Richmond, Surrey
WHITEHEAD, C. F. L. S.	Barming House, Maidstone	SEYMOUR, R. A. H.	46, Earl Street, Maidstone
WILLIAMS, A. G.	Portsea, Hants	SUTTON, M. J.	Henley Park, Oxon

## NORTH-WESTERN DIVISION (WORCESTERSHIRE, GLOUCESTERSHIRE, HEREFORDSHIRE, MONMOUTHSHIRE, AND WALES).

(10 Representatives.)

CHESTER-MASTEN, COL. T. W.	Knowle Park, Almondsbury	ALEXANDER, D. T.	Cardiff
LLOYD, H.	Plas Clybeyll, Pontardawe, R.S.O., Glam.	BAKER, G. E. LLOYD	Hardwicke Court, Gloucester
MARTIN, G. E.	Ham Court, Upton-on-Severn	BRITTEN, ADMIRAL R. F.	Kenswick, Worcester
PHILLIPS, C. D.	Newport, Mon. (Mon.)	TAYLOR, H. W.	Showle Court, Ledbury
STRATTON, R.	The Duffryn, Newport	TURNER, A. P.	The Leen, Pembridge, Hereford

## WITHOUT REFERENCE TO DISTRICT DIVISION.

(8 Representatives.)

BEST, CAPT. T. G.	Redrice, Andover, Hants	COBB, H. M.	Higham, Kent
GORING, C.	Wiston Park, Steyning	MATHEWS, E.	Chequers Mead, Potters Bar
LATHAM, T.	Dorchester, Oxon	NAPER, COL. W. D.	84, Cornwall Gardens, London, S.W.
RANSOME, J. E.	Orwell Works, Ipswich	WEBB, E.	Wordesley, Stourbridge

**STANDING COMMITTEES, 1901-1902.**[The PRESIDENT is *ex-officio* Member of all Committees.]**AGRICULTURAL EDUCATION.**HOBHOUSE, H., M.P., *Chairman.*

ACLAND, SIR C. T. D., Bart.	GIBBONS, G. GORING, REV. J.	MASKELYNE, N. STORY, F.R.S.
ALLEN, J. D.	HALL, J. F.	PAGET, RT. HON. SIR R. H., Bart.
BAKER, G. E. LLOYD	KNOLLYS, C. R.	SUTTON, M. J.
BEST, COL. G.	LATHAM, T.	
FOXCROFT, E. T. D.		

(With power to add to their number.)

**ALLOTMENT.**BEST, CAPT. J. C., *Chairman.*

BEST, COL. G.	EDWARDS, C. L. F.	NAPIER, H. B.
BOTELER, CAPT. W. J. C.	GIBBONS, G.	SILLIFANT, A. O.

**CONTRACTS.**LLEWELLYN, COL. E. H. (M.P.), *Chairman.*

BEST, CAPT. J. C.	EDWARDS, C. L. F.	NEVILLE-GRENVILLE, R.
BOTELER, CAPT. W. J. C.	NAPIER, H. B.	

**DAIRY.**ACLAND, SIR C. T. D., Bart., *Chairman.*

ALLEN, J. D.	KNOLLYS, C. R.	NAPIER, H. B.
ASHCROFT, W.	LATHAM, T.	NEVILLE-GRENVILLE, R.
BOSCAWEN, REV. A. T.	LLEWELLYN, COL. E. H. (M.P.)	PAGET, RT. HON. SIR R. H., Bart.
FOWLER, W. H.	MASKELYNE, N. STORY, F.R.S.	SOMERVILLE, A. F.
GIBBONS, G.	MATHEWS, E.	STRACHEY, SIR E., Bart. (M.P.)
GIBSON, J. T.		TAYLOR, H. W.
HALL, J. F.		

**DISQUALIFYING.**

THE STEWARDS OF HORSES. | THE STEWARDS OF STOCK.  
THE STEWARD OF POULTRY.

**EXPERIMENTS.**ACLAND, SIR C. T. D., Bart., *Chairman.*

ALLEN, J. D.	GIBSON, J. T.	NEVILLE-GRENVILLE, R.
ASHCROFT, W.	HEYTESBURY, LORD	PAGET, RT. HON. SIR R. H., Bart.
BAKER, G. E. LLOYD-	HOBHOUSE, H. (M.P.)	RAWLENCE, E. A.
DYKE, T.	KNOLLYS, C. R.	RUTHERFORD, J. A.
BRUCE, A. F. M.	LLEWELLYN, W. J.	SKINNER, A. C.
FARWELL, F. G.	MASKELYNE, N. STORY, F.R.S.	SUTTON, M. J.
GIBBONS, G.		

(With power to add to their number.)

**FINANCE.**COLLINS, C. R., *Chairman.*

DYKE, T.	MARTIN, G. E.
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**IMPLEMENT REGULATIONS.**SHELLEY, SIR J., Bart., *Chairman.*

ACLAND, SIR C. T. D., Bart.	DYKE, T.	NAPIER, H. B.
BEST, CAPT. J. C.	EDWARDS, C. L. F.	NEVILLE-GRENVILLE, R.
BOTELER, CAPT. W. J. C.	GIBBONS, G.	RANSOME, J. E.
BRITTEN, ADMIRAL, R. F.	HEYTESBURY, LORD	

**JOURNAL.**

ACLAND, SIR C. T. D., Bart., *Chairman.*

DYMOND, F. W.  
FARWELL, F. G.

MARTIN, G. E.

MASKELYNE, N. STORY,  
F.R.S.

**JUDGES' SELECTION.**

BEST, COL. G., *Chairman.*

ALLEN, J. D.

GIBBONS, G.

SHELLEY, SIR J., Bart.

CHESTER-MASTER, COL.,  
T. W.

HALL, J. F.

SILLIFANT, A. O.

DRUCE, A. F. M.

LLEWELLYN, W. J.

WILLIAMS, E. W.

MOORE-STEVENS, J. C.

**RAILWAY ARRANGEMENTS AND ADVERTISEMENTS.**

BEST, CAPT. J. C., *Chairman.*

ALEXANDER, D. T.

DRUCE, A. F. M.

LOPES, SIR M., Bart.

AMHERST, EARL

DRUMMOND, H. W.

PHILLIPS, C. D.

CORK, EARL OF  
COVENTRY, EARL OF

LLEWELLYN, COL. E. H.  
(M.P.)

SHELLEY, SIR J., Bart.

(With power to add to their number.)

**SCIENCE AND ART.**

WYATT-EDGELL, COL. A., *Chairman.*

ACLAND, SIR C. T. D.,  
Bart.

DAW, R. R. M.

MOORE-STEVENS, J. C.

BATH, MARQUESS OF

FARWELL, F. G.

MORRELL, G. H. (M.P.)

CUNDALL, H. M. (F.S.A.)

HALL, J. F.

[F.R.S.]

WILLIAMS, E. W.

MASKELYNE, N. STORY,

(With power to add to their number.)

**SELECTION.**

THE CHAIRMEN OF ALL OTHER COMMITTEES.

**SHOW DATES.**

BEST, CAPT. J. C., *Chairman.*

THE CHAIRMEN OF THE ALLOTMENT, DAIRY, FINANCE, IMPLEMENT REGULATIONS,  
RAILWAY ARRANGEMENTS, AND STOCK PRIZE-SHEET COMMITTEES, and THE  
STEWARD OF WORKS.

(With power to add two to their number.)

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FARWELL, F. G.

MOORE-STEVENS, J. C.

ASHCROFT, W.

GIBBONS, G.

SHELLEY, SIR J., Bart.

BATH, MARQUESS OF

HEYTESBURY, LORD

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STANFORD, A.

BUCKINGHAM, REV. F. F.

(M.P.)

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DRUCE, A. F. M.

LLEWELLYN, W. J.

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 FARWELL, F. G.

*Cattle, Sheep and Pigs.*

DRUCE, A. F. M.  
 SILLIFANT, A. O.  
 LLEWELLYN, W. J.

*Cider.*

FARWELL, F. G.

*Dairy.*

GIBBONS, G.                      KNOLLYS, C. R.

*Dairy Schools.*

GIBBONS, G.

*Dairy Tests.*

LLEWELLYN, COL. E. H. (M.P.)

*Experiments.*

ASHCROFT, W.              DRUCE, A. F. M.

*Finance.*

COLLINS, C. R.              MARTIN, G. E.  
                                     DYKE, T.

*Horses.*

BEST, COL. G.  
 HEYTESBURY, LORD

*Horticulture.*

FOWLER, W. H.

*Music.*

CUNDALL, H. M. (F.S.A.)

*Poultry.*

ASHCROFT, W.

*Shoeing.*

LATHAM, T.

*Works.*

NAPIER, H. B.

*Yard.*

BEST, CAPT. J. C.  
 EDWARDS, C. L. F.  
 BOTELER, CAPT. W. J. C.

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*Local Treasurer*—DYMOND, F. W.

*Consulting Surveyor*—SPACKMAN, H.

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*Associate Editor.*

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*Consulting Chemist.*

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*Consulting Botanist.*

CARRUTHERS, W. (F.R.S.)

*Veterinary Inspector.*

BROWN, SIR G. T. (C.B.)

*Superintendent of Works.*

ROSSITER, J.

# Annual Exhibitions.

( lxxxix )

Year.	Place Visited.	Local Subscription.	Prizes.			President.	Admissions.		
			Local Committee.	Local Societies.	Local Realisation.		On 22. days.	On 12. days.	Total.
1852	Taunton	£ 210	£	£	£	Lord Portman.	..	..	..
1853	Plymouth	£ 450	..	..	£ 450	Sir T. D. Acland, Bart.	..	..	..
1854	Bath	£ 450	..	..	£ 450	William Miles, M.P.	..	..	..
1855	Tiverton	£ 450	..	..	£ 450	Earl Fortescue	..	..	..
1856	Yeovil	£ 450	..	..	£ 450	C. A. Moody, M.P.	..	..	..
1857	Newton Abbot.	£ 700	..	..	£ 700	Lord Courtenay	..	..	..
1858	Cardiff	£ 800	..	..	£ 800	Lord Courtenay	..	..	..
1859	Barnstaple	£ 800	£ 85	..	£ 1	John Sillifant.	..	..	..
1860	Dorchester	£ 900	..	..	£ 900	Lord Rivers	10,709	11,949	22,658
1861	Truro	£ 900	..	..	£ 900	J. W. Buller, M.P.	15,201	14,220	29,421
1862	Wells	£ 900	..	..	£ 900	Sir T. D. Acland, Bart.	10,578	4,775	15,353
1863	Exeter	£ 900	..	..	£ 900	Marquis of Bath	15,635	19,284	34,919
1864	Bristol	£ 1000	£ 105	..	£ 50	Earl Fortescue	22,377	65,678	88,055
1865	Hereford	£ 900	£ 358	..	..	Lord Taunton.	16,575	35,261	51,836
1866	Salisbury	£ 900	..	..	..	Earl of Portsmouth	7,288	18,737	26,025
1867	Salisbury	£ 57	..	..	..	J. Tremayne	7,502	16,702	24,204
1868	Falmouth	£ 900	..	..	£ 900	Sir J. T. B. Duckworth, Bart.	11,393	19,495	30,888
1869	Southampton	£ 132	..	..	£ 18	Earl of Carnarvon	15,340	41,290	56,630
1870	Taunton	£ 900	..	..	£ 900	Sir S. H. Northcote, Bart., C.B., M.P.	17,952	33,653	51,605
1871	Guildford	£ 900	£ 110	..	..	Earl of Cork	10,656	23,406	34,062
1872	Dorchester	£ 800	..	..	£ 10	Duke of Marlborough, K.G.	12,791	21,517	34,308
1873	Plymouth	£ 800	£ 400	..	..	Earl of Mount-Edgumbe	16,665	45,744	62,409
1874	Bristol	£ 800	£ 403	..	..	Sir Massey Lopes, Bart., M.P.	37,329	72,791	110,120
1875	Croydon.	£ 800	£ 245	..	..	R. Benyon, M.P.	14,518	26,028	40,546
1876	Hereford	£ 800	£ 381	..	..	Earl of Ducie	16,396	32,645	49,041

ANNUAL EXHIBITIONS—continued.

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution.	President.	Admissions.			
			Local Committee.	Local Societies.	Local Residents.			On 54. day.	On 24. days.	On 14. Days.	Total.
1877	Bath	800	£ 215	£ ..	£ ..	1015	Marquis of Lansdowne	..	27,625	48,852	76,477
1878	Oxford	800	..	170	6	976	Earl of Jersey	..	12,414	26,995	39,409
1879	Exeter	800	..	..	10	810	Earl of Morley	..	14,634	40,533	55,167
1880	Worcester	800	..	254	..	1054	Earl of Coventry	..	8,415	37,675	46,090
1881	Tunbridge Wells	800	245	34	..	1079	Marquess of Abergavenny.	..	13,368	33,236	46,604
1882	Cardiff	800	200	198	17	1215	Lord Tredegar	..	23,941	38,680	62,621
1883	Bridgwater	800	78	..	..	878	Lord Brooke, M.P.	..	17,171	31,241	48,412
1884	Maunstone	800	310	33	75	1218	Viscount Holmesdale	..	13,501	31,053	44,554
1885	Brighton	800	227	33	82	1142	Viscount Hampden	..	9,637	39,851	49,488
1886	Bristol	800	525	..	..	1325	Lord Carlingford	..	29,580	70,999	100,579
1887	Dorchester	800	..	112	..	912	Earl of Ilchester	..	8,860	29,846	38,706
1888	Newport (Mon.)	800	100	..	..	900	Lord Tredegar	..	14,878	38,567	53,445
1889	Exeter	800	..	..	10	810	Lord Clinton	..	16,405	36,195	52,600
1890	Rochester	800	294	..	26	1120	Earl of Darnley	..	3,480	48,314	51,794
1891	Bath	800	50	103	100	1053	Earl Temple	..	23,510	52,185	75,695
1892	Swansea	800	200	100	10	1110	Sir J. T. D. Llewelyn, Bart.	..	18,364	54,609	72,973
1893	Gloucester	800	400	..	..	1200	Lord Fitzhardinge	..	14,272	40,368	54,640
1894	Guildford	800	174	..	10	984	Earl of Onslow	..	8,671	29,813	38,484
1895	Taunton	800	85	160	10	1055	Viscount Portman	..	13,181	30,111	43,292
1896	St. Albans	800	152	..	..	952	Earl of Clarendon	..	12,056	22,880	34,936
1897	Southampton	800	50	..	..	850	Lord Montagu of Beaulieu	..	8,284	33,750	42,034
1898	Cardiff	800	200	..	..	1000	Lord Windsor	..	13,101	42,501	55,602
1899	Exeter	800	..	225	5	1030	Lord Clinton	..	16,091	39,832	55,923
1900	Bath	800	100	150	10	1060	Marquess of Bath	..	954	11,601	36,814
1901	Croydon	800	115	..	..	915	{ H.R.H. The Duke of Cornwall } and York, K.G. . . . .	1,196	9,362	30,693	41,251

## Members' Privileges.

### EXAMINATION OF PLANTS AND SEEDS.

Members of the Bath and West and Southern Counties Society, who may also be Members of other Agricultural Societies, are particularly requested, in applying for Examination of Plants and Seeds, to state that they do so as Members of the first-named Society.

THE Council have arranged for the following rates of charge for the examination, by the Society's Consulting Botanist, of Plants and Seeds for the *bond fide* and individual information and benefit of Members of the Society (not being seedsmen). The charge for examination must be paid at the time of application, and the carriage of all parcels must be prepaid.

No.

- 1.—A report on the purity and germinating power of a sample of seed, stating the sorts and amount of any other seeds found therein . . . . . 1s.
- 2.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention . . . . . 1s.
- 3.—Report on any disease affecting farm crops . . . . . 1s.
- 4.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value . . . . . 6s.

*N.B.*—The Consulting Botanist's Reports on Seeds are furnished to enable Members,—purchasers of seeds and corn for Agricultural or Horticultural purposes,—to test the value of what they buy, and not to be used or made available for advertising or trade purposes.

### PURCHASE OF SEEDS.

The purchaser should obtain from the vendor, by invoice or otherwise, a proper designation of the seed he buys, with a guarantee that it contains not more than a specified amount of other seeds, and is free from ergot, or, in the case of clovers, from dodder, and of the percentage of seeds that will germinate.

The germination of cereals, green crops, clover, and timothy grass should be not less than 90 per cent.; of fox-tail not less than 60 per cent.; of other grasses not less than 70 per cent.

The Council strongly recommend that the purchase of prepared mixtures should be avoided, and that the different seeds to be sown should be purchased separately.

### INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES.

#### I. SEEDS.

In sending seed or corn for examination the utmost care must be taken to secure a fair and honest sample. In the case of grass-seeds the sample should be drawn from the centre of the sack or bag, and in all cases from the bulk delivered to the purchaser and not from the purchase sample. When bought by sample, the whole or part of that sample should also be sent.

When it is considered necessary to secure legal evidence, the sample should be taken from the bulk and placed in a sealed bag in the presence of a reliable witness who is acquainted with the identity of the bulk, and care should be taken that the purchased sample and bulk be not tampered with after delivery, or mixed or come in contact with any other sample or stock.

One ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. The exact name under which the seed has been bought should be sent with it.

*Grass-seeds should be sent at least FOUR WEEKS, and clover-seeds TWO WEEKS before they are required, and they should not be sown until the report has been received.*

#### II. PLANTS.

In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. They should be placed in a bottle, or packed in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

Parcels or letters containing seeds or plants for examination (carriage or postage prepaid) must be addressed to Mr. W. CARRUTHERS, F.R.S., 43, Central Hill, Norwood, London, S.E.

## Members' Privileges.

### ANALYSES OF FERTILISERS, FEEDING-STUFFS, WATERS, SOILS, &c.

*Applicable only to the case of Persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis.)*

**Members of the Bath and West and Southern Counties Society, who may also be Members of other Agricultural Societies, are particularly requested, in applying for Analyses, to state that they do so as Members of the first-named Society.**

THE Council have fixed the following rates of Charges for Chemical Analyses to Members of the Society.

These privileges are applicable only when the Analyses are for *bond fide* agricultural purposes, and are required by Members of the Society for their own use and guidance in respect of farms or land in their own occupation and within the United Kingdom.

The analyses are given on the understanding that they are required for the individual and sole benefit of the Member applying for them, and must not be used for other persons, or for commercial purposes.

Land or estate agents, bailiffs, and others, when forwarding samples, are required to state the names of those Members on whose behalf they apply.

Members are also allowed to send for analysis under these privileges any manures or feeding-stuffs to be used by their outgoing tenants, or which are to be given free of cost to their occupying tenants.

The analyses and reports may not be communicated to either vendor or manufacturer, except in cases of dispute.

Members are requested, when applying for an analysis, to quote the number in the subjoined schedule under which they wish it to be made.

No.		
1.	An opinion of the purity of bone-dust or oil-cake (each sample)	2s. 6d.
2.	An analysis of sulphate or muriate of ammonia, or of nitrate of soda, together with an opinion as to whether it be worth the price charged	5s.
3.	An analysis of guano; showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia, together with an opinion as to whether it be worth the price charged	10s.
4.	An analysis of mineral superphosphate of lime for soluble phosphates only, together with an opinion as to whether it be worth the price charged	5s.
5.	An analysis of superphosphate of lime, dissolved bones, &c., showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime, and ammonia, together with an opinion as to whether it be worth the price charged	10s.
6.	An analysis of bone-dust, basic slag, or any other ordinary artificial manure, together with an opinion as to whether it be worth the price charged	10s.
7.	An analysis of compound artificial manures, animal products, refuse substances used for manure, &c.	from 10s. to £1
8.	An analysis of limestone, showing the proportion of lime	7s. 6d.
9.	An analysis of limestone, showing the proportion of lime and magnesia	10s.
10.	An analysis of limestone or marl, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay	10s.
11.	Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime	10s.
12.	Complete analysis of a soil	£3
13.	An analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre, as well as of starch, gum, and sugar in the aggregate; and an opinion of its feeding and fattening or milk-producing properties	10s.
14.	Analysis of any vegetable product	10s.
15.	Determination of the "hardness" of a sample of water before and after boiling	5s.
16.	Analysis of water of land-drainage, and of water used for irrigation	£1
17.	Analysis of water used for domestic purposes	£1 10s.
18.	An analysis of milk (to assist Members in the management of their Dairies and Herds, <i>bond fide</i> for their own information and not for trade purposes, nor for use in connection with the Sale of Food and Drugs Acts)	5s.
19.	Personal consultation with the Consulting Chemist. (To prevent disappointment it is suggested that Members desiring to hold a consultation with the Consulting Chemist should write to make an appointment)	5s.
20.	Consultation by letter	5s.
21.	Consultation necessitating the writing of three or more letters	10s.

Members wishing to exercise their privileges on the above-named terms, should forward their samples for examination, *by post or parcel, prepaid*, to the Consulting Chemist, Dr. JOHN AUGUSTUS WOELCKER, M.A., F.I.C., 22, Tudor Street, New Bridge Street, London, E.C.

The fees for analysis must be sent to the Consulting Chemist at the time of application.

## GUIDE TO PURCHASERS OF FERTILISERS AND FEEDING-STUFFS.

UNDER the provisions of the Fertilisers and Feeding Stuffs Act of 1893, District Agricultural Analysts have been appointed throughout the country to examine samples taken in compliance with the Act. Inasmuch, however, as the procedure necessitated in these cases is very complicated, Members of the Bath and West and Southern Counties Society will find it much simpler to avail themselves of the privileges afforded by the Society, and will be able to protect themselves, both amply and with far less trouble, by making their purchases in accordance with the following directions, and by stipulating that purchases shall be subject to the analysis and report of the Society's Consulting Chemist.

Purchasers are recommended in every case to insist upon having an *Invoice* given to them. This invoice should set out clearly:—

**In the case of Fertilisers—**

- (1.) the name of the fertiliser;
- (2.) whether the fertiliser be artificially compounded or not;
- (3.) the minimum analysis guaranteed in respect of the principal fertilising ingredients.

**In the case of Feeding-Stuffs—**

- (1.) the name of the article;
- (2.) the description of the article: whether it has been made from one substance or seed only, or from more than one.

(NOTE.—The use of the terms "Linseed-cake," "Cotton-cake," &c., implies that these cakes shall be "pure," and purchasers are recommended to insist upon these terms being used without any qualification such as "95 per cent.," "as imported," &c. "Oil-cake" should be avoided. Mixed feeding-cakes and meals should be only purchased with a guaranteed analysis.)

Members of the Society should see that the *Invoices* agree accurately with the orders given by them, and, in giving these orders, they should stipulate that the goods come up to the guarantees set out in the following list, and that they be sold subject to the analysis and report of the Consulting Chemist of the Bath and West and Southern Counties Society.

### FERTILISERS.

**Raw Bones, Bone-meal, or Bone-dust** to be guaranteed "**PURE**," and to contain not less than 45 per cent. of Phosphate of Lime, and not less than 4 per cent. of Ammonia.

**Steamed or "Degelatinised" Bones** to be guaranteed "**PURE**," and to contain not less than 55 per cent. of Phosphate of Lime, and not less than 1 per cent. of Ammonia.

**Mineral Superphosphate of Lime** to be guaranteed to contain a certain percentage of "**Soluble Phosphate**." [From 25 to 28 per cent. of Soluble Phosphate is an ordinarily good quality.]

**Dissolved Bones** to be guaranteed to be "**made from raw bone and acid only**," and to be sold as containing stated minimum percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia.

**Compound Artificial Manures, Bone Manures, Bone Compounds, &c.**, to be sold by analysis stating the minimum percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia contained.

**Basic Slag** to be guaranteed to contain a certain percentage of Phosphoric Acid, and to be sufficiently finely ground that 80 to 90 per cent. passes through a sieve having 10,000 meshes to the square inch.

**Peruvian Guano** to be described by that name, and to be sold by analysis stating the minimum percentages of Phosphates and Ammonia.

**Sulphate of Ammonia** to be guaranteed to be "PURE," and to contain not less than 24 per cent. of Ammonia.

**Nitrate of Soda** to be guaranteed to be "PURE" and to contain 95 per cent. of Nitrate of Soda.

**Kainit** to be guaranteed to contain 23 per cent. of Sulphate of Potash.

All Fertilisers to be delivered in good and suitable condition for sowing.

#### FEEDING-STUFFS.

**Linseed Cake, Cotton Cake** (Decorticated and Undecorticated), and **Rape Cake** (for feeding purposes) to be pure, i.e. prepared *only* from the one kind of seed from which their name is derived, and to be in sound condition. The report of the Consulting Chemist of the Bath and West and Southern Counties Society to be conclusive as to the "purity" or otherwise of any feeding-stuffs.

**Mixed Feeding Cakes, Meals, &c.**, to be sold on a guaranteed analysis.

All Feeding-Stuffs to be sold in sound condition, and to contain nothing of an injurious nature, or worthless for feeding purposes.

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## INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

### GENERAL RULES.

1.—A sample taken for analysis should be fairly *representative of the bulk* from which it has been drawn.

2.—The sample should reach the Analyst *in the same condition* as it was at the time when drawn.

### FERTILISERS.

When **Fertilisers** are delivered in bags, select four or five of these from the bulk, and either turn them out on a floor and rapidly mix their contents, or else drive a shovel into each bag and draw out from as near the centre as possible a couple of shovelfuls of the manure, and mix these quickly on a floor.

Halve the heap obtained in either of these ways, take one-half (rejecting the other) and mix again rapidly, flattening down with the shovel any lumps that appear. Repeat this operation until at last only some three or four pounds are left.

From this fill three tins, holding from  $\frac{1}{2}$ -lb. to 1-lb. each, mark, fasten up and seal each of these. Send one for analysis, and retain the others for reference.

Or,—the manure may be put into glass bottles provided with well-fitting corks; the bottles should be labelled and the corks sealed down. The sample sent for analysis can be packed in a wooden box and sent by post or rail.

When manures are delivered in bulk, portions should be successively drawn from *different parts* of the bulk, the heap being turned over now and again. The portions drawn should be thoroughly mixed, sub-divided, and, finally, samples should be taken as before, except that when the manure is coarse and bulky it is advisable to send larger samples than when it is in a finely-divided condition.

### FEEDING-STUFFS.

— **Linseed, Cotton, and other Feeding Cakes.**—If a single cake be taken, three strips should be broken off right across the cake and from the middle portion of it, one piece to be sent for analysis, and the other two retained for reference. Each of the three pieces should be marked, wrapped in paper, fastened up and sealed. The piece forwarded for analysis can be sent by post or rail.

A more satisfactory plan is to select four to six cakes from different parts of

the delivery, then break off a piece about four inches wide from the middle of each cake, and pass these pieces through a cake-breaker. The broken cake should then be well mixed, and three samples of about 1 lb. each should be taken and put in tins or bags duly marked, fastened, and sealed as before. One of these lots should be sent for analysis, the remaining two being kept for reference. It is advisable, also, with the broken pieces to send a small strip from an unbroken cake.

**Feeding Meals, Grain, &c.**—Handfuls should be drawn from the centre of half-a-dozen different bags of the delivery; these lots should then be well mixed, and three  $\frac{1}{2}$ -lb. tins or bags filled from the heap, each being marked, fastened up, and sealed. One sample is to be forwarded for analysis and the others retained for reference.

#### SOILS, WATERS, &c.

**Soils.**—Have a wooden box made 6 inches in length and width, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil and its subsoil 9 to 12 inches deep; trim this block to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up, gently turn over the box, nail on the lid, and send by rail. The soil will then be received in the position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

**Waters.**—Samples of water are best sent in glass-stoppered Winchester bottles, holding half-a-gallon. One such bottle is sufficient for a single sample. Care should be taken to have these scrupulously clean. In taking a sample of water for analysis it is advisable to reject the first portion drawn or pumped, so as to obtain a sample of the water when in ordinary flow. The bottle should be rinsed out with the water that is to be analysed, and it should be filled nearly to the top. The stopper should be secured with string, or be tied over with linen or soft leather. The sample can then be sent carefully packed either in a wooden box with sawdust, &c., or in a hamper with straw.

**Milk.**—A pint bottle should be sent in a wooden box.

#### GENERAL INSTRUCTIONS.

**Time for Taking Samples.**—All samples, both of fertilisers and feeding-stuffs, should be taken as soon after their delivery as possible, and should reach the Analyst within *ten days* after delivery of the article. In every case it is advisable that the Analyst's certificate be received before a fertiliser is sown or a feeding-stuff is given to stock.

**Procedure in the Event of the Vendor wishing Fresh Samples to be Drawn.**—Should a purchaser find that the Analyst's certificate shows a fertiliser or feeding-stuff not to come up to the guarantee given him, he may inform the vendor of the result and complain accordingly. He should then send to the vendor *one* of the two samples which he has kept for reference. If, however, the vendor should demand that a fresh sample be drawn, the purchaser must allow this, and also give the vendor an opportunity of being present, either in person or through a representative whom he may appoint. In that case, three samples should be taken in the presence of both parties with the same precautions as before described, *each* of which should be duly packed up, labelled, and *sealed* by both parties. One of these is to be given to the vendor, one is to be sent to the Analyst, and the third is to be kept by the purchaser for reference or future analysis if necessary.

All samples intended for the Consulting Chemist of the Society should be addressed (postage or carriage prepaid) to Dr. J. AUGUSTUS VOELCKER, M.A., F.I.C., 22, Tudor Street, New Bridge Street, London, E.C. Separate letters of instruction should be sent at the same time.

**PLYMOUTH MEETING,**

MAY 27, 28, 29, 30, AND 31, 1902.

**MONEY PRIZES.**

	£	s.	d.	PAGE
HORSES .. .. .	800	0	0	xcvii
CATTLE .. .. .	1,242	0	0	cii
SHEEP .. .. .	509	5	0	cvi
PIGS .. .. .	245	0	0	cviii
CHEESE .. .. .	106	0	0	cx
BUTTER AND CREAM .. ..	63	10	0	cx
BUTTER-MAKING .. .. .	74	0	0	cxii
MILKING .. .. .	11	5	0	cxiii
SHOEING .. .. .	54	10	0	cxiii
SHEARING .. .. .	26	17	6	cxiv
POULTRY .. .. .	164	5	0	cxxiv
Total .. .. .	£3,296	12	6	

**DONORS OF MONEY PRIZES.**

	£	s.	d.
Bath and West and Southern Counties Society	2,773	10	0
Devon County Agricultural Association .. ..	100	0	0
Plymouth Local Committee .. .. .	105	0	0
Shire Horse Society .. .. .	5	0	0
H. Y. B. Lopes, Esq. .. .. .	10	10	0
J. Bayly, Esq. .. .. .	5	5	0
A. O. Sillifant, Esq. .. .. .	10	10	0
Lord St. Levan .. .. .	20	0	0
Shorthorn Society .. .. .	20	0	0
Red Polled Cattle Society .. .. .	42	10	0
English Aberdeen-Angus Cattle Association ..	10	0	0
English Kerry and Dexter Cattle Society ..	10	10	0
Earl of Mount Edgcumbe .. .. .	20	0	0
English Jersey Cattle Society .. .. .	31	0	0
English Guernsey Cattle Society .. .. .	2	0	0
R. Bayly, Esq. .. .. .	10	10	0
W. R. Flower, Esq. .. .. .	15	0	0
British Berkshire Society .. .. .	5	0	0
Large Black Pig Society .. .. .	20	0	0
Devon County Technical Education Committee	80	7	6

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 £3,296 12 6

# DONORS OF MEDALS AND PLATE.

In addition to the Money Prizes, there are offered :—

- A GOLD MEDAL, in the Shire Horse Classes, by the Shire Horse Society.
- A GOLD and 3 SILVER MEDALS, in the Hunter Classes, by the Hunters' Improvement Society.
- A GOLD MEDAL, in the Hackney and Pony Classes, by the Hackney Horse Society.
- A CHALLENGE CUP, value £52 10s., in the South Devon Classes, by the town of Devonport.
- A GOLD MEDAL, in the Aberdeen Angus Classes, by the Polled Cattle Society.
- A CHALLENGE SILVER BOWL, in the Jersey Classes, by Sir James Blyth, Bart.
- A GOLD, a SILVER, and a BRONZE MEDAL, in the Butter Test Classes, by the English Jersey Cattle Society.
- A SILVER CUP, and a SILVER, and a BRONZE MEDAL, in the Guernsey Butter Test Class, by the English Guernsey Cattle Society.
- TWO CHALLENGE CUPS, value 25 Guineas each, in the Kerry and Dexter Classes, by B. de Bertodano, Esq.
- TWO SILVER MEDALS, in the Southdown Sheep Classes, by the Southdown Sheep Society.
- TWO SILVER MEDALS, in the Pig Classes, by the National Pig Breeders' Association.
- A GOLD MEDAL, and 16 SILVER, and 16 BRONZE MEDALS, in the Cider Classes, by the Society.
- A GOLD, a SILVER, and a BRONZE MEDAL, in the Butter-Making Classes, by the Society.
- A GOLD MEDAL, in the Butter-Making Classes, by the Devon County Technical Education Committee.

# PRIZES.

HORSES.		First Prize.	Second Prize.	Third Prize.
		£	£	£
<i>An Animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of those Prizes headed as Champion or Special Prizes.</i>				
SHIRE.				
(Registered or eligible for registration in the Shire Horse Society's Stud Book.)				
CLASS				
1.—STALLION, foaled before 1900 . . . .	20	10	5	
2.—STALLION, foaled in 1900 . . . .	20	10	5	
3.—COLT, foaled in 1901 . . . .	15	10	5	
VOL. XII.—F. S.			9	

HORSES—continued.		First Prize.	Second Prize.	Third Prize.
CLASS		£ s.	£	£
4.—MARE and FOAL, or in-FOAL . . . .		20	10	5
5.—FILLY or GELDING, foaled in 1899 . . . .		10	5	3
6.—FILLY or GELDING, foaled in 1900 . . . .		10	5	3
7.—FILLY or GELDING, foaled in 1901 . . . .		10	5	3
Offered by the Shire Horse Society, a Gold Medal, value £10, for Best MARE or FILLY in Class 4, 5, 6, or 7, under Conditions 46, and to the Breeder of the winner under the Conditions stated, a Prize of . . . . .		5		
ANY OTHER AGRICULTURAL BREED.				
8.—MARE and FOAL, or in-FOAL . . . . .		10	5	3
ANY AGRICULTURAL BREED.				
(The First Prize in Class 9 is offered by H. Y. B. Lopes, Esq.)				
*9.—Mare and Foal, or in-Foal, the property of a tenant farmer residing in Devon or Cornwall, best suited for breeding Horses for Agricultural purposes . . . . .		10 10	3	
HUNTERS.				
10.—MARE and FOAL, or in-FOAL . . . . .		20	10	5
11.—MARE or GELDING, foaled in 1898 . . . .		20	10	5
12.—FILLY or GELDING, foaled in 1899 . . . .		15	10	5
13.—FILLY or GELDING, foaled in 1900 . . . .		10	7	3
14.—FILLY, COLT, or GELDING, foaled in 1901 . . . .		10	7	3
SPECIAL PRIZES.				
(Offered by R. Bayly, Esq.)				
Best Exhibit in Class 11 or 12, calculated to carry not less than 15 stone . . . . .		5	5	
(Offered by the Hunters' Improvement Society.)				
A Gold Medal, or £5 and a Bronze Medal, for the Best HUNTER BROOD MARE (by a Thoroughbred Horse or Registered Hunter Sire, and in-Foal to, or with Foal at-foot by, a Sire of similar breeding) in Class 10, not having previously won the Hunters' Improvement Society's Gold Medal as a Brood Mare in 1902, under Conditions 47. Prize winners in the class only will be eligible for the Medal.				

\* The Prizes in the Class marked with an asterisk (\*) are offered by or through the Plymouth Local Committee.

HORSES—*continued.*

	First Prize.	Second Prize.	Third Prize.
<b>A Silver Medal, for the Best HUNTER FILLY by a Thoroughbred Horse or Registered Hunter Sire, in Class 12, 13, or 14, not exceeding three years old (foaled in 1899, 1900, or 1901), under Conditions 48. Prize winners in these classes only will be eligible for the Medal.</b>	£	£	£
<b>A Silver Medal, for the Best HUNTER MARE or GELDING of any Age, not having previously won the Society's Silver Medal under this scheme in 1902, bred by a Thoroughbred or Registered Hunter Sire out of a Registered Mare or a Mare qualified for Registration in the next volume, under Conditions 49. Prize winners in the classes only will be eligible for the Medal.</b>			
<b>A Silver Medal, for the Best HUNTER COLT by a Thoroughbred or Registered Hunter Sire out of a Mare registered in the Hunter Stud Book, or entered for the next volume, exhibited in Class 14, and not having previously won the Society's Silver Medal under this scheme in 1902, under Condition 50. Prize winners in the class only will be eligible for the Medal.</b>			

## HACKNEYS.

(Classes 15 to 19 are for Horses registered or eligible for registration in the Hackney Horse Society's Stud Book.)

## CLASS

15.—MARE and FOAL, or in-FOAL . . . . .	15	10	5
16.—MARE or GELDING, foaled before 1898 . . . . .	10	5	3
17.—MARE or GELDING, foaled in 1898 or 1899 . . . . .	10	5	3
18.—FILLY or GELDING, foaled in 1900 . . . . .	10	5	3
19.—FILLY, COLT, or GELDING, foaled in 1901 . . . . .	10	5	3
* 20.—Hackney Mare or Gelding, under 15·3 hands, the property of a bona fide Tenant Farmer, residing in Devon or Cornwall . . . . .	10	5	2

## PONIES.

(The Third Prize in Class 21 is offered by the Plymouth Local Committee.)

21.—MARE, over 13·2 and not over 14·2 hands, with foal at-foot or to foal in 1902 . . . . .	10	5	3
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\* The Prizes in the Classes marked with an asterisk (\*) are offered by or through the Plymouth Local Committee.

HORSES— <i>continued.</i>			
CLASS	First Prize.	Second Prize.	Third Prize.
	£	£	£
22.—MARE or GELDING, 4 years old or over, exceeding 13 and not exceeding 14·2 hands . . . . .	10	5	3
23.—MARE or GELDING, 4 years old or over, not exceeding 13 hands . . . . .	10	5	3
Ponies entered in other Classes can also be entered in Class 24 on payment of an additional fee. (Offered by J. Bayly, Esq.)			
*24.—Pony most suitable for Polo . . . . .	5	5	
SPECIAL PRIZE.			
(Offered by the Hackney Horse Society.)			
A Gold Medal (value £10) for the Best MARE or FILLY exhibited in Classes 15 to 23, under Conditions 51.			
HARNESSES.			
Horses entered in the other Classes can, if eligible, be also entered, on payment of an additional fee, in the Harness Classes. Horses entered in the Double Harness and Tandem Classes can also be entered, on payment of an additional fee, in the Single Harness Classes. Horses entered in the Harness Classes only, and not having a box in the Yard, must be in the Show Yard by 2 p.m. on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as the Class has been judged.			
25.—MARE or GELDING, 15 hands or over, to be driven in harness on the 2nd day of Show . . . . .	10	5	2
26.—PAIR of CARRIAGE HORSES (Mares or Geldings), 15 hands or over, to be driven in double harness on the 2nd day of Show . . . . .	10	5	2
27.—MARE or GELDING, under 15 hands, to be driven in harness on the 3rd day of Show . . . . .	10	5	2
28.—PAIR of CARRIAGE HORSES (Mares or Geldings), under 15 hands, to be driven in double harness on the 3rd day of Show . . . . .	10	5	2
*29.—Best Tradesman's turn out (with one horse and two wheels), used solely and constantly for trade purposes, and to have been in Exhibitor's possession for at least two months prior to date of Show. Open only to Residents within a radius of 5 miles of the Town Hall, Plymouth. To be exhibited on the 4th day of Show . . . . .	5	3	2

\* The Prizes in the Classes marked with an asterisk (\*) are offered by or through the Plymouth Local Committee.

CLASS	HORSES—continued.		
	First Prize.	Second Prize.	Third Prize.
	£	£	£
*30.— <i>Best Tradesman's turn out (with one or two horses and four wheels), used solely and constantly for trade purposes, and to have been in the Exhibitor's possession for at least two months prior to the date of Show. Open only to Residents within a radius of 5 miles of the Town Hall, Plymouth. To be exhibited on the 4th day of Show</i>	5	3	2
31.— <i>TANDEM (Mares or Geldings), to be driven in harness on the 5th day of Show</i>	10	5	2
*32.— <i>Trotting. Best Mare or Gelding for speed and action. To be driven in harness on the 5th day of Show</i>	5	3	2
<b>JUMPING.</b>			
(For Regulations as to Jumping Classes see Conditions 52 on page cv.)			
Horses can be entered in as many Jumping Classes as they are eligible for on payment of the entry fee for each Class, but cannot take more than one First Prize.			
Horses entered in the Jumping Classes only, and not having a box in the Yard, must be in the Show Yard by 2 p.m. on the day on which they compete and, with the consent of the Stewards, may leave the Yard as soon as the Class has been judged.			
*33.— <i>Mare or Gelding, not over 15·2 hands, that shall jump in the best form on the 2nd day of the Show</i>	10	5	2
34.— <i>MARE or GELDING, over 15·2 hands, that shall jump in the best form on the 2nd day of the Show</i>	10	5	2
*35.— <i>Mare or Gelding, not over 15 hands, that shall jump in the best form on the 3rd day of the Show</i>	10	5	2
36.— <i>MARE or GELDING, over 15 hands, that shall jump in the best form on the 3rd day of the Show</i>	10	5	2
*37.— <i>Mare or Gelding, not over 14·2 hands, that shall jump in the best form on the 4th day of the Show</i>	10	5	2
38.— <i>MARE or GELDING, over 14·2 hands, that shall jump in the best form on the 4th day of the Show</i>	10	5	2
39.— <i>MARE or GELDING, not over 14 hands, that shall jump in the best form on the 5th day of the Show</i>	10	5	2
40.— <i>MARE or GELDING, over 14 hands, that shall jump in the best form on the 5th day of the Show</i>	10	5	2

\* The Prizes in the Classes marked with an asterisk (\*) are offered by or through the Plymouth Local Committee.

CATTLE.			
	First Prize.	Second Prize.	Third Prize.
	£ s.	£	£
<p>(£100 towards the prizes in the South Devon Cattle and South Devon, Dartmoor and Exmoor Sheep Classes is contributed by the Devon County Agricultural Association.)</p>			
DEVON.			
CLASS			
41.—BULL, calved in 1898 or 1899 . . . . .	10	5	2
42.—BULL, calved in 1900 . . . . .	12	5	2
43.—BULL, calved in 1901 . . . . .	12	5	2
44.—Cow, in-Milk, calved before 1899 . . . . .	12	5	2
45.—HEIFER, in-Milk, calved in 1899 . . . . .	10	5	2
46.—HEIFER, calved in 1900 . . . . .	10	5	2
47.—HEIFER, calved in 1901 . . . . .	10	5	2
CHAMPION PRIZE.			
(Offered by A. O. Silbfont, Esq.)			
Best Animal in Classes 41 to 47 . . . . .	10 10		
SOUTH DEVON.			
48.—BULL, calved in 1898 or 1899 . . . . .	10	5	2
49.—BULL, calved in 1900 . . . . .	12	5	2
50.—BULL, calved in 1901 . . . . .	12	5	2
51.—Cow, in-Milk, calved before 1899 . . . . .	12	5	2
52.—HEIFER, in-Milk, calved in 1899 . . . . .	10	5	2
53.—HEIFER, calved in 1900 . . . . .	10	5	2
54.—HEIFER, calved in 1901 . . . . .	10	5	2
CHAMPION PRIZE.			
(Offered by the Town of Devonport.)			
<p>"The Devonport Challenge Cup" (value £52 10s.) for the Best BULLOCK (Bull, Cow, or Heifer) in the South Devon Classes. The Cup to be won by the same Breeder two years in succession, or three years at intervals, before becoming the absolute property of the winner. The winner of the Cup this year will also receive a Special Prize offered by Lord St. Levan of .</p>			
	20		
SHORTHORN.			
55.—BULL, calved in 1898 or 1899 . . . . .	10	5	2
56.—BULL, calved in 1900 . . . . .	12	5	2
57.—BULL, calved in 1901 . . . . .	12	5	2

CATTLE— <i>continued.</i>		First Prize.	Second Prize.	Third Prize.
CLASS		£	£	£
58.—Cow, in-Milk, calved before 1899 . . . . .		12	5	2
<i>(An Animal entered in Class 58 can, if eligible, be also entered, on payment of an additional fee, in Class 59.)</i>				
<i>(The First Prize in Class 59 is offered by the Shorthorn Society.)</i>				
59. Pure-bred Pedigree Shorthorn Dairy Cow, in-Milk, of any age, eligible for and entered in, Coate's Herd Book (or pedigree sent for such entry before the Show), that has not previously won a First Prize offered by the Shorthorn Society in a corresponding Class . . . . .		10	5	
60.—HEIFER, in-Milk, calved in 1899 . . . . .		10	5	2
61.—HEIFER, calved in 1900 . . . . .		10	5	2
62.—HEIFER, calved in 1901 . . . . .		10	5	2
<b>CHAMPION PRIZE.</b>				
<i>(Offered by the Shorthorn Society.)</i>				
Best BULL in Class 55, 56, or 57, entered in or eligible for Coate's Herd Book . . . . .		10		
<b>HEREFORD.</b>				
63.—BULL, calved in 1898 or 1899 . . . . .		10	5	2
64.—BULL, calved in 1900 . . . . .		12	5	2
65.—BULL, calved in 1901 . . . . .		12	5	2
66.—Cow, in-Milk, calved before 1899 . . . . .		12	5	2
67.—HEIFER, in-Milk, calved in 1899 . . . . .		10	5	2
68.—HEIFER, calved in 1900 . . . . .		10	5	2
69.—HEIFER, calved in 1901 . . . . .		10	5	2
<b>SUSSEX.</b>				
70.—BULL, calved in 1898 or 1899 . . . . .		10	5	2
71.—BULL, calved in 1900 or 1901 . . . . .		12	5	2
72.—Cow or HEIFER, in-Milk, calved in or before 1899 . . . . .		12	5	2
73.—HEIFER, calved in 1900 . . . . .		10	5	2
74.—HEIFER, calved in 1901 . . . . .		10	5	2
<b>RED POLLED.</b>				
<i>(The Red Polled Cattle Society contributes £42 10s. towards the Prizes in Classes 75 to 79.)</i>				
75.—BULL, calved in 1898 or 1899 . . . . .		10	5	2
76.—BULL, calved in 1900 or 1901 . . . . .		10	5	2
77.—Cow or HEIFER, in-Milk, calved in or before 1899 . . . . .		10	5	2
78.—HEIFER, calved in 1900 . . . . .		10	5	2
79.—HEIFER, calved in 1901 . . . . .		10	5	2
<b>ABERDEEN-ANGUS.</b>				
<i>(The First Prize in Class 80 is offered by the English Aberdeen-Angus Cattle Association.)</i>				
80.—BULL, calved before 1st December, 1900 . . . . .		10	5	2
81.—BULL, calved on or after 1st December, 1900 . . . . .		10	5	2

CATTLE— <i>continued.</i>		First Prize.	Second Prize.	Third Prize.
CLASS		£ s.	£	£
82.—COW or HEIFER, in-Milk, calved before 1st December, 1899		10	5	2
83.—HEIFER, calved on or after 1st December, 1899		10	5	2
84.—HEIFER, calved on or after 1st December, 1900		10	5	2
<b>CHAMPION PRIZE.</b>				
(Offered by the Polled Cattle Society.)				
A Gold Medal for the Best Breeding Animal in Classes 80 to 84.				
<b>JERSEY.</b>				
85.—BULL, calved in 1898 or 1899		10	5	2
86.—BULL, calved in 1900		12	5	2
87.—BULL, calved in 1901		12	5	2
88.—COW, in-Milk, calved before 1899		12	5	2
89.—HEIFER, in-Milk, calved in 1899		10	5	2
90.—HEIFER, calved in 1900		10	5	2
91.—HEIFER calved in 1901		10	5	2
<b>SPECIAL PRIZE.</b>				
(Offered by Sir James Blyth, Bart.)				
The Blythwood Challenge Silver Bowl, weighing 25 ounces, for the Best COW or HEIFER in-Milk, in any of the Jersey Classes, bred in Great Britain or Ireland, to be awarded by inspection (see Special Conditions 61).				
<b>GUERNSEY.</b>				
92.—BULL, calved in 1898 or 1899		10	5	2
93.—BULL, calved in 1900		12	5	2
94.—BULL, calved in 1901		12	5	2
95.—COW, in-Milk, calved before 1899		12	5	2
96.—HEIFER, in-Milk, calved in 1899		10	5	2
97.—HEIFER, calved in 1900		10	5	2
98.—HEIFER, calved in 1901		10	5	2
<b>KERRY.</b>				
99.—BULL, calved in 1899, 1900, or 1901		7	5	2
100.—COW or HEIFER, in-Milk, calved in or before 1899		7	5	2
101.—HEIFER, calved in 1900 or 1901		7	5	2
<b>CHAMPION PRIZE.</b>				
(Offered by the English Kerry and Dexter Cattle Society.)				
Best Animal in Class 99, 100, or 101		5	5	
Offered by B. de Bertodano, Esq. (instead of above Prize at the option of the winner), the Bertodano Challenge Cup, value 25 Guineas, to become the property of an Exhibitor winning it three years in succession.				

**CATTLE—continued.**

CLASS	DEXTER KERRY.	First Prize.	Second Prize.	Third Prize.
		£ s.	£	£
102.—	BULL, calved in 1899, 1900, or 1901 . . .	7	5	2
103.—	COW or HEIFER, in-Milk, calved in or before 1899 . . .	7	5	2
104.—	HEIFER, calved in 1900 or 1901 . . .	7	5	2

**CHAMPION PRIZE.**

(Offered by the English Kerry and Dexter Cattle Society.)

Best Animal in Class 102, 103, or 104 . . . 5 5

Offered by E. de Bertodano, Esq. (instead of above Prize at the option of the winner), the Bertodano Challenge Cup, value 25 Guineas, to become the property of an Exhibitor winning it three years in succession.

**DAIRY.**

*Animals entered in the Breed Classes can, if eligible, be entered also, on payment of the additional fee, in Classes 105 to 111 inclusive.*

105.—	Cow, in-Milk, of any breed or cross, under 900 lbs. live weight, yielding the largest quantity of Milk, of normal character, containing, on the average of the two competitive milkings, 12 per cent. of total solids, of which not less than 3·25 per cent. shall be fat, the period of lactation being taken into consideration . . .	10	3	2
106.—	Cow, in-Milk, of any breed or cross, 900 lbs. live weight or over ditto ditto . . .	10	3	2

The Prizes in Classes 107 and 108 are offered by the Earl of Mount Edgcumbe, and exhibits must be the property of a *bonâ fide* Tenant Farmer, residing in Devon or Cornwall.

*107.—	South Devon Cow, in-Milk, yielding the largest quantity of milk of normal character, containing on the average of the two competitive milkings, 12 per cent. of total solids, of which not less than 3·25 per cent. shall be fat, the period of lactation being taken into consideration . . .	10		
*108.—	Cow, in-Milk, of any breed or cross, except South Devon ditto ditto . . .	10		

**BUTTER TEST.**

The Prizes in Classes 109 and 110 are offered by the English Jersey Cattle Society, and entries in them are subject to any conditions issued by that Society previous to the Tests.

109.—	Cow, of any breed or cross, under 900 lbs. live weight, obtaining the greatest number of points by the practical Test of the Separator and Churn, judged by the scale of points adopted by the English Jersey Cattle Society . . .	10	3	2
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\* The Prizes in the Classes marked with an asterisk (\*) are offered by or through the Plymouth Local Committee.

CATTLE— <i>continued</i> .			
CLASS	First Prize.	Second Prize.	Third Prize.
110.—Cow of any breed or cross, 800 lbs. live weight and over, obtaining the greatest number of points by the practical Test of the Separator and Churn, judged by the scale of points adopted by the English Jersey Cattle Society	£ 10	£ 3	£ 2
Gold, Silver, and Bronze Medals are offered for the three Jersey COWS, entered or eligible for entry in the English Jersey Herd Book, obtaining the greatest number of points in the Test.			
SPECIAL PRIZE.			
For the Best quality of Butter produced by any Jersey Cow awarded a Medal, Prize, or Certificate of Merit in Class 109 or 110	1		
(The Prizes in Class 111 are offered by the English Guernsey Cattle Society.)			
111. English-bred COW or HEIFER, entered in the English Guernsey Cattle Society's Herd Book, or eligible for entry therein, obtaining the greatest number of points by the practical Test of the Churn, the points to be reckoned on the weight of Butter and an allowance for lactation to be made under the scale settled by the English Guernsey Society.			
1st Prize, Silver Cup, value £5.			
2nd „ Silver Medal and 20s. . . . .		1	
3rd „ Bronze Medal and 20s. . . . .			1
S H E E P.			
COTSWOLD.			
112.—Shearling RAM . . . . .	10	5	2
113.—Pair of RAM LAMBS, dropped in 1902 . . . . .	10	5	2
114.—Pen of three Shearling EWES . . . . .	10	5	2
DEVON LONG-WOOLLED.			
115.—Shearling RAM . . . . .	10	5	2
116.—Pair of RAM LAMBS, dropped in 1902 . . . . .	10	5	2
117.—Pen of three Shearling EWES . . . . .	10	5	2
SOUTH DEVON.			
118.—Shearling RAM . . . . .	10	5	2
119.—Pair of RAM LAMBS, dropped in 1902 . . . . .	10	5	2
120.—Pen of three Shearling EWES . . . . .	10	5	2
SOUTHDOWN.			
121.—Shearling RAM . . . . .	10	5	2
122.—Pair of RAM LAMBS, dropped in 1902 . . . . .	10	5	2
123.—Pen of three Shearling EWES . . . . .	10	5	2

SHEEP— <i>continued</i> .		First Prize.	Second Prize.	Third Prize.
		£ s.	£	£
<b>SPECIAL PRIZES.</b>				
(Offered by the Southdown Sheep Society, under Conditions No. 65.)				
A Silver Medal for the Best Ram or Ram Lamb in Class 121 or 122.				
A Silver Medal for the Best Pen of Ewes in Class 123.				
<b>CLASS</b>	<b>HAMPSHIRE DOWN.</b>			
124.—Shearling RAM . . . . .		10	5	2
125.—Pair of RAM LAMBS, dropped in 1902 . . . . .		10	5	2
126.—Pen of three Shearling EWES . . . . .		10	5	2
<b>SHROPSHIRE.</b>				
127.—Shearling RAM . . . . .		10	5	2
128.—Pair of RAM LAMBS, dropped in 1902 . . . . .		10	5	2
129.—Pen of three Shearling EWES . . . . .		10	5	2
<b>OXFORD DOWN.</b>				
130.—Shearling RAM . . . . .		10	5	2
131.—Pair of RAM LAMBS, dropped in 1902 . . . . .		10	5	2
132.—Pen of three Shearling EWES . . . . .		10	5	2
<b>EXMOOR.</b>				
133.—Shearling RAM . . . . .		10	5	2
134.—Pair of RAM LAMBS, dropped in 1902 . . . . .		10	5	2
135.—Pair of three Shearling EWES . . . . .		10	5	2
<b>DARTMOOR.</b>				
136.—Shearling RAM . . . . .		10	5	2
137.—Pair of RAM LAMBS, dropped in 1902 . . . . .		10	5	2
138.—Pen of three Shearling EWES . . . . .		10	5	2
<b>*SPECIAL PRIZE.</b>				
(Offered by R. Bayly, Esq.)				
Best Ram or Pen of Ewes in Classes 136 to 138 . . . . .		5	5	
<b>SOMERSET AND DORSET HORNED.</b>				
139.—Shearling RAM . . . . .		5	3	2
140.—Pair of RAM LAMBS, dropped after November 1st, 1901 . . . . .		5	3	2
141.—Pen of three Shearling EWES . . . . .		5	3	2
The Prizes in Class 142 are offered by W. R. Flower, Esq.				
142.—Pen of Three Ewe Lambs . . . . .		10	3	2

\* The Prizes in the Classes marked with an asterisk (\*) are offered by or through the Plymouth Local Committee.

P I G S.		First Prize.	Second Prize.	Third Prize.
CLASS	BERKSHIRE.	£	£	£
143.—BOAR, farrowed in 1899, 1900, or 1901 . . .		7	3	2
144.—Pair of BOARS, farrowed in 1902 . . .		5	2	1
145.—Breeding Sow, farrowed before 1902 . . .		7	3	2
146.—Pair of Breeding Sows, farrowed in 1902 . . .		5	2	1
<b>SPECIAL PRIZE.</b>				
(Offered by the British Berkshire Society.)				
Best Pig in the Berkshire Classes entered in, or eligible for, the Herd Book . . .		5		
<b>LARGE BLACK.</b>				
<i>(£20 of the amount offered in Prizes in Classes 147 to 150 is contributed by the Large Black Pig Society.)</i>				
147.—BOAR, farrowed in 1899, 1900, or 1901 . . .		7	3	2
148.—Pair of BOARS, farrowed in 1902 . . .		5	2	1
149.—Breeding Sow, farrowed before 1902 . . .		7	3	2
150.—Pair of Breeding Sows, farrowed in 1902 . . .		5	2	1
<b>LARGE WHITE.</b>				
151.—BOAR, farrowed in 1899, 1900, or 1901 . . .		7	3	2
152.—Pair of BOARS, farrowed in 1902 . . .		5	2	1
153.—Breeding Sow, farrowed before 1902 . . .		7	3	2
154.—Pair of Breeding Sows, farrowed in 1902 . . .		5	2	1
<b>MIDDLE WHITE.</b>				
155.—BOAR, farrowed in 1899, 1900, or 1901 . . .		7	3	2
156.—Pair of BOARS, farrowed in 1902 . . .		5	2	1
157.—Breeding Sow, farrowed before 1902 . . .		7	3	2
158.—Pair of Breeding Sows, farrowed in 1902 . . .		5	2	1
<b>SMALL WHITE or SMALL BLACK.</b>				
159.—BOAR, farrowed in 1899, 1900, or 1901 . . .		7	3	2
160.—Pair of BOARS, farrowed in 1902 . . .		5	2	1
161.—Breeding Sow, farrowed before 1902 . . .		7	3	2
162.—Pair of Breeding Sows, farrowed in 1902 . . .		5	2	1
<b>TAMWORTH.</b>				
163.—BOAR, farrowed in 1899, 1900, or 1901 . . .		7	3	2
164.—Pair of BOARS, farrowed in 1902 . . .		5	2	1
165.—Breeding Sow, farrowed before 1902 . . .		7	3	2
166.—Pair of Breeding Sows, farrowed in 1902 . . .		5	2	1
<b>SPECIAL PRIZES.</b>				
(Offered by the National Pig Breeders' Association.)				
Silver Medal for the Best BOAR, of the Large White, Middle White, Small White, or Tamworth breed, exhibited in Classes 161 to 166, eligible for entry in the Herd Book, and not having previously won the Society's Medal during 1902.				
Silver Medal for the Best SOW, ditto ditto.				

## **PRODUCE.**

### **CIDER.**

(Open to Growers or Makers.)

**First Prize in each Class, a Silver Medal and a Certificate.**

**Second Prize in each Class, a Bronze Medal and a Certificate.**

### **CHAMPION PRIZE.**

**For Best Exhibit in any of the Classes, a Gold Medal and a Certificate.**

The Cider must have been made in 1901, and each Exhibit in Cask must consist of not less than 18 gallons.

#### **Cider made in Devon.**

##### **CLASS**

- 167.—Cask of CIDER, containing not less than 4 per cent. of alcohol.
- 168.—12 Bottles of CIDER, ditto
- 169.—Cask of CIDER, containing less than 4 per cent. of alcohol.
- 170.—12 Bottles of CIDER, ditto

#### **Cider made in Herefordshire.**

- 171.—Cask of CIDER, containing not less than 4 per cent. of alcohol.
- 172.—12 Bottles of CIDER, ditto
- 173.—Cask of CIDER, containing less than 4 per cent. of alcohol.
- 174.—12 Bottles of CIDER, ditto

#### **Cider made in Somerset.**

- 175.—Cask of CIDER, containing not less than 4 per cent. of alcohol.
- 176.—12 Bottles of CIDER, ditto
- 177.—Cask of CIDER, containing less than 4 per cent. of alcohol.
- 178.—12 Bottles of CIDER, ditto

#### **Cider made in Counties other than Devon, Hereford, or Somerset.**

- 179.—Cask of CIDER, containing not less than 4 per cent. of alcohol.
- 180.—12 Bottles of CIDER, ditto
- 181.—Cask of CIDER, containing less than 4 per cent. of alcohol.
- 182.—12 Bottles of CIDER, ditto

	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
	£	£	£	£
<b>CHEESE.</b>				
<hr/>				
CLASS				
183.—Three CHEESES (not less than 56 lbs. each), made in 1901 . . . . .	15	10	5	3
184.—Three Cheddar CHEESES (not less than 28 lbs. each), made in 1901 by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools held since 1898 . . . . .	8	5	3	2
185.—Three CHEESES (not less than 28 lbs. each), made in 1902 . . . . .	8	5	3	2
186.—Three Cheddar CHEESES (not less than 28 lbs. each), made in 1902 by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools held since 1898 . . . . .	6	4	2	1
187.—Eight Loaf or other Truckle CHEESES, made in 1902 . . . . .	5	3	2	1
188.—Three Caerphilly CHEESES, made in 1902 . . . . .	3	2	1	10s.
189.—Three Cream or other Soft CHEESES . . . . .	3	2	1	10s.

## BUTTER AND CREAM.

(These Classes are not open to Professional Teachers.)

190.—3 lbs. of Fresh (or very slightly salted) BUTTER, made of Cream from Cows other than Channel Island Breeds . . . . .	4	3	2	1
191.—3 lbs. of Fresh (or very slightly salted) BUTTER, made of Cream from Cows of Channel Island Breeds only . . . . .	4	3	2	1
192.—3 lbs. of Fresh (or very slightly salted) BUTTER, made from scalded Cream . . . . .	4	3	2	1
193.—3 lbs. of BUTTER, to which no salt whatever has been added . . . . .	4	3	2	1

BUTTER AND CREAM—continued.				
	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
<b>SPECIAL PRIZES.</b>	£	£	£	£
Three Prizes of £1 each will be given for BUTTER, which has the Best keeping qualities, exhibited in Class 190, 191, 192, or 193. 1 lb. will be taken on the first day of the Show from each Prize lot of Butter in the Classes named, and will be judged on the last day of the Show.	1 1 1			
<b>CLASS</b>				
194.—12 lbs. of Salted BUTTER, in a jar or crock, to be delivered to the Secretary four weeks before the Show . . . . .	4	3	2	1
195.—4 half-pounds of Clotted or Devonshire CREAM . . . . .	3	2	1	10s.
The Prize in Class 196 is offered by the Plymouth Local Committee.				
*196.—4 half-pounds of Scalded Milk Cream produced in Devon or Cornwall . . . . .	4			
<b>BUTTER-MAKING.</b>				
(No Winner of a First Prize given by this Society for Butter-making during the last three years is eligible to compete in Classes 197 to 200.)				
(For Conditions and Regulations see Entry Form.)				
197.—For Dairymaids working for wages in a dairy belonging to a tenant farmer. On the 1st day of the Show . . . . .	4	3	2	1
198.—For Men and Women (except the winner of the 1st Prize in Class 197) who have never won a First Prize in any open Butter-making competition. On the 2nd day of the Show . . . . .	4	3	2	1
199.—For Men and Women (except the winners of the 1st Prizes in Classes 197 and 198). On the 3rd day of the Show . . . . .	4	2	3	1
200.—For Men and Women (except the winners of the 1st Prizes in Classes 197, 198, and 199). On the 4th day of the Show . . . . .	4	3	2	1

\* The Prizes in the Classes marked with an asterisk (\*) are offered by or through the Plymouth Local Committee.

First Prize.	Second Prize.	Third Prize.	Fourth Prize.	Fifth Prize.	Sixth Prize.
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£ s. £ s. £ s. £ s. £ s. £ s. £ s. £ s.

3 0 2 0 1 0 0 10

3 0 2 10 2 0 1 10 1 0 0 1

3 0 2 0 1 0 0 10

3 0 2 10 2 0 1 10 1 0 0 1

**(No Competitor will be allowed  
to take more than one Prize  
in Classes 201 to 204.)**

**BUTTER-MAKING—continued.**

CLASS	CHAMPION CLASSES.	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
		£ s.	£ s.	£ s.	£ s.
205.—	For winners of First and Second Prizes in the Butter-making Classes 197 to 200 or at any previous meeting of the Society. On the 5th day of the Show 1st Prize, Gold Medal. 2nd „ Silver Medal. 3rd „ Bronze Medal.				
206.—	For First and Second Prize Winners in Classes 201, 202, 203, and 204. On the 5th day of the Show. Gold Medal, value £2 2s.				

**MILKING.**

207.—For Men 20 years of age and over . . .	1 10	1 0	0 15	0 10
208.—For Women 20 years of age and over . . .	1 10	1 0	0 15	0 10
209.—For Boys and Girls under 20 years of age . . .	1 10	1 0	0 15	0 10

**SHOEING.**

210.—For NAG HORSE SHOEING, by Smiths over 25 years of age who have not previously won the First Prize in a corresponding class at one of the Society's meetings, or a Champion Prize at any other Society's Show. On the 3rd day of Show . . .	4 0	3 0	2 0	1 0
211.—For CART HORSE SHOEING, by Smiths over 25 years of age, ditto ditto. On the 4th day of Show . . .	4 0	3 0	2 0	1 0
212.—For Smiths under 25 years of age. (Competitors in this Class will be required to declare their age at the time of entry, and also to state whether they wish to shoe a Nag or a Cart Horse. On the 5th day of Show . . .	4 0	3 0	2 0	1 0
213.—For NAG HORSE SHOEING, by previous winners of one of the Society's First Prizes or a Champion Prize at any other Society's Show. On the 5th day of Show . . .	5 0			

SHOEING— <i>continued.</i>		First Prize.	Second Prize.	Third Prize.	Fourth Prize.	Fifth Prize.
		£   s.	£   s.	£   s.	£   s.	£   s.
The Prizes in Classes 214 to 216 are offered by the Devon County Technical Education Committee, and are open only to Masters or Journeyman (not Apprentices) who have passed the examinations of the County Farriery Schools previous to March 31, 1902. The Competitions will take place on the 2nd day of Show.						
CLASS						
214.—For Masters or Journeymen. To Shoe a Hunter . . . . .		3   0	2   0	1   0	0   10	
215.—For Masters or Journeymen. To Shoe a Hack or Harness Horse . . . . .		3   0	2   0	1   0	0   10	
216.—For Masters or Journeymen. To Shoe an Agricultural Horse . . . . .		3   0	2   0	1   0	0   10	
SHEEP SHEARING.						
Offered by the Devon County Technical Education Committee, and confined to those who have attended at least four instruction lessons given under the Committee in their respective districts at any time prior to the Show.						
217.—For Agricultural Labourers over 19 years of age, on the 4th day of Show . . . . .		2   10	1   10	1   0	0   10	
218.—For Agricultural Labourers over 16 and not over 19 years of age, on the 4th day of Show . . . . .		2   10	1   10	1   0	0   10	7s. 6d.
219.—For Farmers or Farmers' Sons, over 19 years of age, on the 4th day of Show . . . . .		2   10	1   10	1   0	0   10	
220.—For Farmers or Farmers' Sons, over 16 and not over 19 years of age, on the 5th day of Show . . . . .		2   10	1   10	1   0	0   10	7s. 6d.
221.—For Boys not over 16 years of age, on the 5th day of Show . . . . .		1   10	1   0	0   15	0   10	7s. 6d.
(Each Competitor must shear two sheep, without assistance, in 1½ hours.)						

## CONDITIONS AND REGULATIONS.

### GENERAL.

#### ENTRIES.

1. The following are the Fees payable for Stock Entries made on or before April 7. After that date and up to April 14, Entries (except in the Harness and Jumping Classes) will only be received on payment, in each case, of double the Fee named below. *Exhibitors are requested to note that no exception can be made to this.* The Entry-fee is not returnable to an Exhibitor who enters an Animal in a Class for which it is ineligible.

		Members.	Non-Members.
		(see Reg. 5 below)	
Horses other than in the Harness or			
Jumping Classes (see Reg. 2 below),			
including Horse Box .. .. .	for each Entry	10s.	.. 20s.
Cattle, Sheep, and Pigs .. .. .	do.	5s.	.. 15s.

For particulars as to fees in the Cider, Dairy, Poultry, Shoeing and Shearing Classes, see Entry forms.

2. Horses entered in the Harness and Jumping Classes, and not having a box in the Yard, must be in the Yard by 2 p.m. on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as they have been judged. Entries in the Harness and Jumping Classes, if no Horse Box is required, must reach the Secretary not later than May 10. If a Box is required the Entry must reach the Secretary on or before April 7, or, at double fees, by April 14. The Entry Fees are—

		Members.	Non-Members.
		(see Reg. 5 below)	
Without Horse Box .. .. .	for each Entry	5s.	.. 10s.
With Horse Box .. .. .	do.	10s.	.. 20s.

3. No Exhibitor can make more than three Entries in any one Class of Horses, Cattle, Sheep, or Pigs, except in the Harness or Jumping Classes.

4. No Entry will be received unless the Fee accompanies it, and (if the Exhibitor is a Member of the Society) the subscription for the year, unless previously paid, together with any arrears that may be due.

5. The privilege of entering at Members' Fees is strictly limited to Members of the Society, or of the Devon County Agricultural Association, elected on or before January 28, 1902, and subscribing not less than 11. annually.

6. Where a Prize is offered for a *pair* or *pen* of Animals, Single Entry-fees only are payable for each *pair* or *pen*, and only one Entry-form must be used.

7. All Entries must be made on the printed forms to be obtained of the Secretary (THOS. F. FLOWMAN, 4, Terrace Walk, Bath), and, in applying for Forms, Exhibitors are requested to state how many Entries they wish to make of either Horses, Cattle, Sheep, Pigs, &c., as each Stock Entry must be made on a separate Form.

8. Every Exhibitor or Competitor is requested to carefully examine the List of Prizes and Conditions, as he will be held responsible for the correctness of his Certificate of Entry. An Exhibitor omitting to give information

asked for on the Entry-form, with regard to the age, breeder, name, colour, sire, dam, &c., of an Animal, will be liable to have his Entry disqualified.

9. If an Exhibitor or Competitor fails, when called upon by the Stewards or Council, to prove the correctness of his Certificate of Entry to their satisfaction, the Entry may be disqualified, and any Award made to it cancelled.

10. An Exhibitor who has made, in due time, an Entry of Horses, Cattle, Sheep, or Pigs in a particular Class, will be permitted, up to Tuesday, April 29, to withdraw the Entry of such Animal, and to substitute for it the Entry of another Animal in the same Class, on payment of the difference, if any, between the amount of the Entry-fee originally paid for the Animal withdrawn, and the post Entry-fee.

11. An Animal can be entered in as many Classes as it is eligible for on payment of an additional Fee in each Class. No additional Fee is, however, payable in the case of Special Prizes for Exhibits already entered in any particular Class.

12. Every Exhibit must be the *bonâ fide* property of the Exhibitor both at the time of Entry and on the first day of the Exhibition.

#### SHOWYARD.

13. The Yard will be open for the reception of Horses (see Regulation 2 for Harness and Jumping Horses), Cattle, Sheep, and Pigs, on Saturday and Monday, May 24 and 26, from 7 A.M. to 6 P.M. Horses will also be received from 6 to 8 o'clock on the morning of the first day of Show, but all other Stock Entries must be in the Yard the previous day. A Label denoting the number of each Entry will be sent by the Secretary, and must be securely affixed to the head of the Animal, or, in the case of other Exhibits, to the receptacle containing such Exhibits. The carriage of Exhibits must in all cases be paid by the Exhibitor. No Exhibit subject to charges will be received by the Officers of the Society.

14. All Live Stock (see Conditions 2, 38, and 39 for exceptions with regard to Horses) must remain in their places in the Showyard until after six o'clock in the afternoon of the last day of the Show, and shall under no circumstances be taken out of their places in the interval without the special permission of the Stewards.

15. During the time the Show is open to the public no rug or cloth shall be hung up so as to conceal any animal in a horse-box or stall, except with the special permission of the Steward of the department.

16. All Exhibits and all persons in charge of the same, will be subject to the Orders, Regulations, and Rules of the Society, and the Stewards shall have the power to remove from the Yard the Stock or property belonging to, and to cancel the admission ticket of, any Exhibitor who shall infringe any of the Regulations or Conditions of the Meeting, or who shall refuse to comply with any instructions given by the Stewards, without any responsibility attaching to the Stewards or the Society in consequence of such removal.

17. No Animal shall be decorated with colours other than the Society's Prize Rosettes.

18. No person shall be allowed to fix any placard, or to take down any official placard in the Yard without the written permission of the Stewards.

19. All persons in charge of Exhibits will be subject to the orders of the Stewards, and will be required to parade or exhibit the Animals in their charge at such times as may be directed by the Stewards. Servants must be in attendance each day during the Show at least a quarter of an hour before the time appointed for exhibiting the Animals under their charge in the Show-rings. Owners of Animals exhibited will be held responsible for the behaviour

of their Servants, and for the consequences of any misconduct of such Servants.

20. Servants in charge of Stock at night must, if they leave the Yard, return before 10 P.M., or they will not be admitted.

21. Hay, straw, and green food will be supplied by the Society free of expense to Exhibitors at the Forage Stores in the Showyard. Servants must apply at the Forage Stores for their Forage Tickets after they have brought their Animals into the Yard. Corn, meal, and cake can be obtained in the Showyard at fixed prices.

NOTE.—For the convenience of Exhibitors wishing to sell their Animals, a Register will be kept at the Secretary's Office, in which they may enter the prices.

### **TICKETS.**

22. Each Exhibitor of Live Stock will have a Free Ticket of admission to the Showyard sent to him, except in the case of a Member of the Society, who will receive his Member's Ticket in lieu of an Exhibitor's Ticket. Tickets for the use of Servants in charge of Live Stock remaining in the Yard will also be sent, and the Exhibitor will be held responsible for the proper use of such Tickets. In case of transfer or other improper use of a Ticket, the Exhibitor will be required to pay a fine of 1*l.* for each case. Exhibitors will be held responsible for the attendance at each Parade of as many Servants as Tickets have been issued for.

### **RESPONSIBILITY.**

23. Neither the Society nor any of its Officers or Servants shall be in any way responsible or accountable for anything that may happen (from any cause or circumstance whatever) to Exhibitors or their Servants, or to any Animal or Article exhibited, or property brought into the Showyard, or otherwise for anything else in connection with, or arising out of, or attributable to, the Society's Show, or these or any other Conditions or Regulations prescribed by the Society in relation thereto.

24. Each Exhibitor shall be solely responsible for any consequential or other loss, injury, or damage done to, or occasioned by, or arising from, any Animal or Article exhibited by him, and shall indemnify the Society against all legal or other proceedings in regard thereto.

25. The Society, its Officers, and Servants, will not be liable for any errors or mistakes that may happen in placing or penning the Stock or Articles to be exhibited, but the Servants in charge of the same must see that they are placed or penned according to their Entries.

### **DISQUALIFICATIONS.**

26. No Animal which has been exhibited as Fat Stock at any Show shall be eligible to compete for the Prizes offered in this Prize Sheet.

27. No Animal which has taken a First Prize at any Meeting of this Society can compete again in the corresponding Class.

28. An Animal having any unsoundness likely to be transmitted to its progeny, shall be disqualified thereby from receiving any Prize offered by or through the Society.

29. If it shall be proved to the satisfaction of the Stewards or Council that an Exhibitor or Competitor has knowingly signed an incorrect Certificate, or knowingly given an incorrect Pedigree of any Animal, or has attempted to enter an Animal or other Exhibit, or to obtain a Prize by any other unfair

means at this or any other Agricultural Society's Meetings, or is under exclusion from any Breed Society for fraudulent practices, the Council shall have the power to cancel all Awards made to such Exhibitor or Competitor, to disqualify him or her from exhibiting or competing at future Meetings of the Society, and to inform other Agricultural Associations of their action in this respect.

#### **PENALTIES.**

30. As the non-exhibition of Animals entered for the Show causes unnecessary preparations and expense, and disarranges the Showyard, any person entering Stock, and failing to exhibit the same shall pay a penalty of 10s. for each Entry, unless a Certificate, under the hand of the Exhibitor or his authorised Agent, be lodged with the Secretary of the Society, before the day of Exhibition, certifying that such non-exhibition is caused either by— (1) the death of the animal or animals; or (2) contagious or infectious disease (confirmed by the explanatory Certificate of a Veterinary Surgeon); or (3) by its becoming ineligible for the Class in which it has been entered.

31. Every Exhibitor will be required to undertake to forfeit and pay to the Society the sum of 20*l.*, as and for liquidated damages, if any Animal which he exhibits be, to his knowledge, suffering from any contagious or infectious disease, and the Stewards are empowered to prevent the entry of any diseased Animal into the Yard, or to have it removed therefrom.

32. Any infringement of any of these or any other prescribed Regulations or Conditions will subject the Exhibitor to a fine of 1*l.* by the Stewards, and to the forfeiture, by order of the Council, of any Prize to which he may be entitled (in addition to all other consequences attaching to such infringement). The Council reserves to itself the right to inform other Agricultural Associations of any decision it may come to with respect to an Exhibitor.

#### **AWARDS.**

33. The Society reserves to itself the right to withhold any Prize, if, in the opinion of the Stewards, the conditions and regulations have not been properly complied with.

34. No Second Prize will be given in any Class of Stock unless there are three Entries, no Third Prize unless there are six Entries, and no Fourth Prize unless there are nine Entries.

35. Only the signed Awards of the Judges are accepted by the Society as evidence that a Prize has been awarded, and the production of the Prize-card or the rosette by an Exhibitor will not entitle him to the Prize.

36. The Certificate of the Veterinary Inspector, whether as to age or soundness, shall be required only in cases where the Judges are in doubt, or where the Stewards may consider it necessary. The decision of the Inspector in such cases shall be final and conclusive; and in case it shall be against the Animal to which a Prize has been awarded, such Animal shall be disqualified from receiving such Prize.

#### **PROTESTS.**

37. Any Exhibitor wishing to lodge a protest having reference to Live Stock exhibited at this Meeting must make the same in writing on a form to be obtained from the Secretary and deposit with him the sum of 3*l.* If on investigation the protest is not sustained to the satisfaction of the Stewards, the sum thus deposited shall, at the discretion of the Council, be forfeited to the funds of the Society. All protests must be delivered at the Secretary's Office in the Showyard, on the day on which the Award is made, and no pro-

test will be SUBSEQUENTLY received, unless a satisfactory reason be assigned for the delay. The Stewards will consider such protests at Eleven o'clock on the following day at the Secretary's Office, at which time and place any person making a protest must attend or be represented by his authorised Agent. The decision of the Stewards shall be final.

### **APPLYING TO CERTAIN CLASSES ONLY.**

#### **HORSES.**

38. Horses can be removed from the Yard at night on deposit by the Exhibitor of 3*l.* at the Finance Office, which sum will be forfeited if the Horse does not return at 8 A.M. each day during the Exhibition. This regulation does not apply to Horses entered in the Harness and Jumping Classes only.

39. The Stallions in Classes 1 and 2 can be taken out of the Yard after the parade of Horses on the third day of the Show.

40. Exhibitors must provide saddles for Horses in Classes 16, 17, 20, 22, 23, 24, and in Classes 33 to 40, as they are to be ridden; and vehicles and harness for those in Classes 25 to 32, which are to be driven.

41. No Horse, unless a Foal, will be admitted into the ring without a proper bit.

42. The Prizes for Stallions in Class 1 will be withheld until a Certificate from the owner is delivered to the Secretary that the Horse has served at least 20 Mares during the current season.

43. All Foals must be the offspring of the Mares with which they are exhibited, and the name of the Sire of the Foal must be stated on the Certificate of Entry.

44. Mares entered as in-Foal shall hereafter be certified to have produced a living Foal before the 1st August of the year of the Show. If the required Certificate, which must be on a form obtainable from the Secretary, is not received by September 30, 1902, the Prize awarded will be forfeited.

45. Horses may, at the discretion of the Stewards, be measured, and the measurement shall be taken in the shoes worn by the Entry at the time of judging.

46. The following special conditions apply only to the Prize offered by the Shire Horse Society, viz.: the owner of the Animal entered to have been a Member of the Bath and West and Southern Counties Society for not less than six months previous to April 14, 1902; a Mare six years old, or upwards, to have had a living Foal; no Animal to compete which has won the Shire Horse Society's Gold Medal during the current year, the Royal and London Shows being excepted; the winning Animal to be entered, or eligible for entry, in the Shire Horse Society's Stud Book; and a Certificate that she is free from hereditary disease to be lodged with the Secretary of the Shire Horse Society, the Veterinary examination to be made on the ground by the Veterinary Inspector appointed for the Show. A Prize of 5*l.* will also be awarded to the breeder of the Animal winning the Medal, provided he is a Member of the Shire Horse Society and that the Dam is a Mare registered in the Shire Horse Stud Book.

47. The following Special Conditions apply only to the Prize offered by the Hunters' Improvement Society for Hunter Brood Mare, viz.:—The Mare awarded the Medal must, if not already entered, be registered, within a month of the award, in the Hunter Stud Book, and must possess a Certificate of soundness from hereditary disease, signed by the Bath and West Society's appointed Veterinary Inspector, who must be a Member of the Royal College

of Veterinary Surgeons, after his examination of the Animal on the Show Ground. In the case of Mares entered as "in-foal," a further Certificate of foaling must also be lodged with the Secretary of the Hunters' Improvement Society before the Award will be confirmed.

**NOTE.**—If the Judges select a Brood Mare whose Entry for the Stud Book was lodged before the date of the Bath and West Society's Show, the Prize will be increased to a Gold Medal and 1*l.*, or 5*l.* and a Silver Medal.

48. The following Special Conditions apply only to the Prize offered by the Hunters' Improvement Society for Hunter Filly. The Filly awarded the Medal must, if not already entered, be registered, within a month of the Award, in the Hunter Stud Book, and not having previously won the Hunters' Improvement Society's Silver Medal in 1902, and must possess a Certificate of soundness from hereditary disease, signed by the Bath and West Society's appointed Veterinary Inspector, who must be a Member of the Royal College of Veterinary Surgeons, after his examination of the Animal on the Show Ground.

**NOTE.**—If the Judges select a Filly whose Entry for the Stud Book was lodged before the date of the Bath and West Society's Show, the Prize will be increased to a Silver Medal and 1*l.*

49. The following Special Conditions apply only to the Prize offered by the Hunters' Improvement Society for best Mare or Gelding of any age. The Hunter awarded the Medal must possess a Certificate of soundness from hereditary disease signed by the Bath and West Society's Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the Animal on the Show Ground; if a Mare is selected, both she and her Dam, if not already entered, must be registered within a month of the Award in the Hunter Stud Book; if a Gelding is selected, the Dam must comply with such conditions before the Award will be confirmed. No Animal may take more than one of these Medals in 1902.

50. The following Special Condition applies only to the Gold Medal offered by the Hunters' Improvement Society for Hunter Colt:—The Hunter Colt awarded the Medal must possess a Certificate of soundness from hereditary disease signed by the Bath and West Society's Veterinary Inspector, who must be a Member of the Royal College of Veterinary Surgeons after his examination of the animal on the Show Ground.

51. The following Special Conditions apply only to the Gold Medal offered by the Hackney Horse Society for Hackney Mare or Filly:—A Mare, six years old or upwards, to have had a living Foal. An Animal, having been awarded one of the Hackney Society's Gold Medals, to be ineligible to take a second Medal during the current year, the Royal and London Shows being excepted. Any Animal awarded a Medal must be entered or accepted for registry in the Hackney Horse Society's Stud Book, and a Certificate that it is free from hereditary disease must be lodged with the Secretary of the Hackney Horse Society before the Medal will be despatched.

52. The following Special Conditions apply to Horses entered in the Jumping Competitions:—The jumps may consist of single hurdle, gate, double hurdle, bank, wall and water jump, at the discretion of the Judge and Stewards. Each Horse competing shall have its catalogue number affixed to its breast in such a way that it may be easily seen by the general public. Each Horse competing shall be ridden at the fences in the order announced by the Stewards. In case of a Horse refusing his fence it shall be allowed two further trials and *no more*. No change of rider shall take place during the competition. The Judge may take into consideration the style in which the fences are jumped and his decision shall be final.

**CATTLE.**

53. All Cattle must be properly secured to the satisfaction of the Officers of the Society, on being brought to the gate of the Yard, or they will not be admitted.

54. All Bulls must have a ring or clamp attached to the nose, and in the aged Classes must be provided with a strong chain, and be led with a proper stick.

55. All Cattle will be required to be paraded in the ring at least once a day at the discretion of the Stewards.

56. No Bull calved before January 1, 1900, or in the Aberdeen-Angus Classes before December 1, 1899, will be eligible to receive a Prize until certified to have served not less than six different Cows (or Heifers), previous to June 1, 1902, and to be the sire of live Calves dropped in the year 1902.

57. No Cow or Heifer, entered as in-milk, will be eligible to receive a Prize until certified to have had a living Calf within the fifteen months preceding the date of Show, or that the Calf, if dead, was born at the proper time.

58. Every Cow or Heifer in-milk shall be milked dry in the Showyard at 6 P.M. on the evening preceding the day of judging, or, in the Milk and Butter Test Classes, at such hours as the Stewards may appoint, in the presence of an Officer of the Society appointed for the purpose.

59. Any Animal in the Cattle Classes found to be artificially coloured will be disqualified.

60. Any person selling Milk in the Yard, except in the place appointed by the Stewards, will be fined 5s. for each infringement of this Regulation.

61. The Blythwood Challenge Bowl when won two years in succession or three years at intervals, by different Animals belonging to the same Exhibitor, will become absolutely his property. Any Animal having been awarded one of the "Blythwood Bowls" in 1902 will not be eligible to compete for a second in the current year. The possessor of the Bowl must give security to the Society that it shall be delivered up to the Secretary 14 days before the commencement of the Society's Show the following year; and in the event of the same Exhibitor not being the winner of the Bowl the second year, a Silver Medal will be given him by Sir James Blyth, as a memento of his success in the previous year.

62. Except in the Local and Dairy Classes, every Animal entered for Competition must be entered, or certified as eligible to be entered, in the Herd Book of its Breed, where such Herd Book exists, and has been in existence for not less than seven years. Where an Animal is entered by the Exhibitor as eligible for Entry in the Herd Book of its Breed, proof of such eligibility must be furnished to the Secretary at the time of making the Entry.

**SHEEP.**

63. All Sheep (except those in the Mountain Classes, which must be shown in their wool) over one year old must have been really and fairly shorn bare on or after the 1st of March, 1902. If the Judges consider that a Sheep has not been shorn bare they will report this to the Stewards, with a view to its disqualification.

64. Each pen of Ewes must be of the same Flock.

65. The following conditions apply to the Special Prizes offered by the Southdown Sheep Society:—The sheep competing must be entered or eligible for entry in the Flock Book. In the classes for pairs of ram lambs Exhibitors will have the privilege of competing for the Medal with any one of their Exhibits.

**Pigs.**

66. The Pair of Pigs in each pen must be of the same litter.

67. All Sows farrowed before 1902 shall be certified to have had a litter of live Pigs within six months preceding the first day of exhibition, or to be in-Pig at the time of entering, so as to produce a litter of Pigs, farrowed at their proper time, before the 1st of September following. In the case of in-Pig Sows the Prize will be withheld until the Exhibitor shall have furnished the Secretary with a Certificate of farrowing as above. If the required Certificate, which must be on a form obtainable from the Secretary, is not received on or before the 15th September following, the Prize awarded will be forfeited.

68. All Pigs exhibited with a Sow shall be her own produce, of the same litter, and not exceeding two months old at the time of the Show.

69. No Sow above 18 months old that has not produced a litter of live Pigs shall be eligible to compete in any of the Classes.

70. Any Animal in the Pig Classes found to be artificially coloured will be disqualified.

**CIDER, DAIRY PRODUCE, POULTRY, MILKING, SHOEING AND SHEARING.**

*For Conditions and Regulations see Entry-Forms.*

**ADJUDICATION OF PRIZES.**

71. The Judges are instructed as follows, and Entries are received subject to this :—

a. Not to award any Prize or Commendation unless the Entry possesses sufficient merit.

b. Not to award a Prize to any Horse or Mare unless it is free from unsoundness likely to be transmitted to its progeny; or if a Gelding, unless free from unsoundness; in either case, an accident having temporary consequences only excepted.

c. In awarding Prizes to Cattle, Sheep, and Pigs, to decide according to the relative merits of the Animals for Breeding purposes, and not to take into consideration their present value to the butcher.

d. To make the milking capacity and form of udder one of the chief points in awarding Prizes to pure bred Shorthorn Cows and Heifers.

e. To draw the attention of the Stewards to any Exhibit that has been improperly prepared for exhibition or is wrongly entered.

f. To report to the Stewards for disqualification any Sheep which in their opinion has not been shorn bare.

g. To give in a "RESERVED NUMBER" in each Class, indicating the Animal or Exhibit which in their opinion possesses sufficient merit for the Prize, if the Animal or Exhibit to which the Prize is awarded should become disqualified. Should the "Reserve Number" succeed to a Prize, and be itself disqualified, the Prize will be forfeited.

h. Immediately after the Judging to deliver to the Stewards on the special sheets, to be obtained at the Secretary's Office, their Awards, signed, stating the numbers to which the Prizes are adjudged, and noting all disqualifications.

72. Should any question arise upon which the Judges may desire a further opinion, the Stewards shall provide them with a Referee.

### **PAYMENT OF PRIZES.**

73. Cheques for the Prizes awarded (except where further qualification of an Animal is required) will be drawn at the meeting of the Finance Committee held in July, 1902, and will then be forwarded by post to the Exhibitors to whom they have been awarded.

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### **INTERPRETATION OF CONDITIONS.**

74. The Society reserves to itself by its Council the sole and absolute right to interpret these or any other prescribed Conditions and Regulations, or Prize Sheets, and to arbitrarily settle and determine all matters, questions, or differences in regard thereto, or otherwise arising out of or connected with or incident to the Show. Also to refuse and to cancel any Entries, disqualify Exhibitors, prohibit exhibition of Entries, vary or cancel awards of Prizes or Reserved Numbers, and relax Conditions, as the Society may deem expedient.

## PLYMOUTH MEETING,

MAY 27, 28, 29, 30, AND 31, 1902.

## PRIZES FOR POULTRY.

<i>(In Classes 37 to 46 the birds must have been hatched after Dec. 31, 1901.)</i>		First Prize.	Second Prize.	Third Prize.
CLASS		£ s.	s. d.	s. d.
1.—	ANY DISTINCT BREED—Cock and 4 Hens, bred in 1901 or 1902, the property of one Exhibitor	5 0	60 0	40 0
2.—	COCHIN—Cock	1 10	15 0	10 0
3.—	Ditto—Hen	1 10	15 0	10 0
4.—	BRAHMA—Cock	1 10	15 0	10 0
5.—	Ditto—Hen	1 10	15 0	10 0
6.—	LANGSHAN—Cock	1 10	15 0	10 0
7.—	Ditto—Hen	1 10	15 0	10 0
8.—	PLYMOUTH ROCK—Cock	1 10	15 0	10 0
9.—	Ditto—Hen	1 10	15 0	10 0
10.—	WYANDOTTE—Cock	1 10	15 0	10 0
11.—	Ditto—Hen	1 10	15 0	10 0
12.—	ORPINGTON—Cock	1 10	15 0	10 0
13.—	Ditto—Hen	1 10	15 0	10 0
14.—	MINORCA—Cock	1 10	15 0	10 0
15.—	Ditto—Hen	1 10	15 0	10 0
16.—	ANDALUSIAN—Cock or Hen	1 10	15 0	10 0
17.—	LEGHORN—Cock	1 10	15 0	10 0
18.—	Ditto—Hen	1 10	15 0	10 0
19.—	HAMBURG—Cock	1 10	15 0	10 0
20.—	Ditto—Hen	1 10	15 0	10 0
21.—	DORKING (Coloured)—Cock	1 10	15 0	10 0
22.—	Ditto—Hen	1 10	15 0	10 0
23.—	DORKING (Silver Grey)—Cock	1 10	15 0	10 0
24.—	Ditto—Hen	1 10	15 0	10 0
25.—	DORKING (White or Cuckoo)—Cock	1 10	15 0	10 0
26.—	Ditto—Hen	1 10	15 0	10 0
27.—	OLD ENGLISH GAME—Cock	1 10	15 0	10 0
28.—	Ditto—Hen	1 10	15 0	10 0
29.—	INDIAN GAME—Cock	1 10	15 0	10 0
30.—	Ditto—Hen	1 10	15 0	10 0
31.—	MALAY—Cock	1 10	15 0	10 0
32.—	Ditto—Hen	1 10	15 0	10 0
33.—	FRENCH—Cock	1 10	15 0	10 0
34.—	Ditto—Hen	1 10	15 0	10 0
35.—	ANY OTHER DISTINCT BREED (not previously mentioned)—Cock	1 10	15 0	10 0
36.—	Ditto—Hen	1 10	15 0	10 0
37.—	Cochin, Brahma, Langshan, Plymouth Rock, Wyandotte, or Orpington—Cockerel	1 10	15 0	10 0
38.—	Ditto—Pullet	1 10	15 0	10 0
39.—	Minorca, Andalusian, Leghorn, Hamburg, or French—Cockerel	1 10	15 0	10 0
40.—	Ditto—Pullet	1 10	15 0	10 0

CLASS	First Prize.	Second Prize.	Third Prize.
	£ s.	s. d.	s. d.
41.—Dorking, Game, Malay, or any other Distinct Breed (not previously mentioned)—Cockerel . . . . .	1 10	15 0	10 0
42.—Ditto—Pullet . . . . .	1 10	15 0	10 0

**LIVE TABLE POULTRY.**

43.—Pair of Cockerels of any Pure Breed . . . . .	1 10	15 0	10 0
44.—Ditto—Pullets . . . . .	1 10	15 0	10 0
45.—Pair of Cross-bred Cockerels . . . . .	1 10	15 0	10 0
46.—Ditto—Pullets . . . . .	1 10	15 0	10 0

**SELLING CLASSES.**

47.—ANY DISTINCT BREED—Cook (price not to exceed 1l. 1s.) . . . . .	1 10	15 0	10 0
48.—ANY DISTINCT BREED—Hen (price not to exceed 1l. 1s.) . . . . .	1 10	15 0	10 0

**DUCKS, GEESE, AND TURKEYS.**

49.—DRAKE or DUCK (Aylesbury) . . . . .	1 10	15 0	10 0
50.—Ditto (Rouen) . . . . .	1 10	15 0	10 0
51.—Ditto (Pekin) . . . . .	1 10	15 0	10 0
52.—GANDER or GOOSE . . . . .	1 10	15 0	10 0
53.—TURKEY—Cook or Hen . . . . .	1 10	15 0	10 0

**DEAD TABLE POULTRY.**

*(To be forwarded alive, and to be killed and plucked by a Poulterer acting for the Society. See Regulation 12.)*

*(In Classes 54 to 58 the birds must have been hatched after December 31, 1901.)*

54.—Pair of Cockerels of any Pure Breed . . . . .	1 0	15 0	10 0
55.—Ditto—Pullets . . . . .	1 0	15 0	10 0
56.—Pair of Cross-bred Cockerels . . . . .	1 0	15 0	10 0
57.—Ditto—Pullets . . . . .	1 0	15 0	10 0
58.—Pair of Ducklings . . . . .	1 0	15 0	10 0

## POULTRY.

## CONDITIONS AND REGULATIONS.

## CHARGES, &amp;c.

1. Exhibitors may make an unlimited number of Entries in each Class on payment of Fees as follows:—

	Members.	Non-Members.
	s. d.	s. d.
Classes 1 to 53 . . . . .	2 6	5 0
Dead Poultry Classes, 54 to 58 . . . . .	1 0	2 6

The above Fees include coops, food, and attendance.

N.B.—The above Fees must be sent with the Entries, or no notice will be taken of the latter.

2. The privilege of entering at Member's Fees is strictly limited to Members of the Society, or of the Devon County Agricultural Association, elected on or before January 28, 1902, and subscribing not less than 1*l.* annually.

3. All Entries must be made on the printed forms, to be obtained of the Secretary (THOS. F. PLOWMAN, 4, Terrace Walk, Bath), and such forms must be correctly filled up and returned to the Secretary, together with all Fees due, on or before May 2. Exhibitors are requested to carefully examine the List of Prizes and Conditions, as the Society cannot be responsible for any errors made by Exhibitors in the Entry-forms, and birds entered in a wrong Class will be necessarily excluded from competition. No alterations can be made in Entry-forms after they have been received by the Secretary.

4. The Council reserve the right to refuse the Entries of any person.

5. Exhibitors must state the price and breed of their birds on their Entry-forms.

## SHOWYARD.

6. All birds must be in the Showyard by 6 P.M. on *Monday, May 26*, and no bird can be removed before Saturday, May 31, at 7 P.M. Any Exhibitors who send for their birds must do so between 7 and 8 P.M. on that day.

7. All carriage must be prepaid to Plymouth Railway Station, otherwise the birds will not be received at the Exhibition; but they will be conveyed free of expense from the Station to the Showyard and back.

8. No Exhibitor or Servant will be allowed into the tent until the birds have been judged.

9. The Poultry Tent will not be open to the public until 2 o'clock on the first day of the Exhibition.

10. A Non-Transferable Admission Ticket for the Exhibition will be sent to each Exhibitor whose Entry-fees amount to 1*l.* and upwards.

## TABLE POULTRY.

11. In these Classes (43 to 46 and 54 to 58) quality for the table will be considered before mere weight. The date of hatching must be given, and, in the case of cross-bred birds, the breeds of the parents.

12. In Classes 54 to 58 the whole of the birds will be first exhibited alive. They will all be killed on the evening of Tuesday, May 27, and trussed by a qualified Poulterer, the Prizes being finally awarded to the dead birds. These will then all be exhibited, but will be withdrawn from exhibition when considered necessary, and, if unsold, will be returned to Exhibitors after 6 P.M. on Thursday, May 29.

Exhibitors are recommended to put a reasonable price upon their Exhibits in these Classes so as to promote the sale of them.

### SALES.

13. All birds may be claimed, at the price put upon them, any time after 4 o'clock on Tuesday, May 27, and a sale *must take place* if the price stated be paid to the Clerk in the Poultry Office at the time of claiming. *No alteration can be made in the prices stated on the Entry-forms* and in the Catalogue until after Thursday, May 29, when the price may be reduced on payment to the Stewards of 1s. per pen on each alteration. Birds must be *sold in pens*, and the price stated must include the basket. A charge of 10 per cent. will be made for all birds sold. The persons who have the management of the sales cannot take charge of birds which are disposed of privately.

### AWARDS.

14. No Second Prize will be given in any of the Classes unless there are three Entries, and no Third Prize unless there are six Entries.

### DISQUALIFICATIONS.

15. The Judges are empowered to withhold a prize or prizes where birds are not considered of sufficient merit, and are instructed to disqualify any that have been clipped, dubbed, drawn, trimmed, marked, or dyed.

16. An Exhibitor detected in a false statement as to the age, &c., of any bird, or in any other practice calculated to deceive or mislead the Judges or Stewards, shall forfeit all or any Prizes awarded to him or her at the Show, and will be disqualified from competing at any future Show of the Society, and the Council shall have the power to inform other Societies of their action in this respect.

17. No person who shall have been shown to the satisfaction of the Council to have been excluded from exhibiting for Prizes at the Exhibition of any other Society in consequence of having attempted to obtain a Prize by giving a false Certificate, or by other unfair means, and no person who is under exclusion from any Breed Society for fraudulent practices, shall be allowed to exhibit at this or any other Meeting of the Society.

18. Unhealthy birds will not be exhibited, but will be immediately returned to their owners, and the Fees will be forfeited.

### PROTESTS.

19. In order to check frivolous and vexatious protests, no protest will be entertained unless accompanied by a deposit of 1*l.* in each case; and in case the protest is not substantiated, the deposit may be forfeited to the funds of the Society. All protests must be made before 12 o'clock (noon) on Wednesday, May 28.

### FORFEITS.

20. Persons entering birds, and failing to send the same to the Exhibition, will forfeit the entrance Fee for each pen so left vacant.

### GENERAL.

21. All birds shown must be *bonâ fide* the property of the Exhibitor.

22. For each pen entered, the Exhibitor will receive a Label, on the reverse side of which he must legibly write his name and address for the return journey.

23. All Eggs laid at the Exhibition will be destroyed.

24. The Stewards pledge themselves to take every care of the birds exhibited, but neither they nor the Society will, in any case, be responsible for any accident, loss, or

damage, from whatever cause arising, the Exhibits being entered at the sole risk of the Exhibitors, and Exhibitors will be required to hold the Society harmless in the event of loss.

25. In case of death of any bird during the Exhibition, it will be sent back for the inspection of the Exhibitor.

26. The Poultry Department is subject to the Rules and Regulations of the Society and its Officers.

\*.\* *The use of properly-constructed Poultry Baskets will facilitate the safe and speedy conveyance of the birds to and from the Exhibition.*

*The Society cannot, under any circumstances, undertake to send telegrams to Exhibitors as to Judges' Awards.*

*Applications for Catalogues (price 1s. each) and printed lists of Awards should be made only to the Publishers, Messrs. W. LEWIS AND SONS, Herald Office, Bath.*

By Order of the Council,

**THOMAS F. FLOWMAN**, *Secretary.*

4, Terrace Walk, Bath.

**Telegraphic Address—"FLOWMAN, BATH."**

**F I N A N C I A L   S T A T E M E N T S**

**FOR**

**1901**

***WITH ITEMS OF 1900 FOR COMPARISON.***

	PAGES
SUMMARY OF THE CASH ACCOUNT .. ..	CXXX, CXXXI
DETAILED CASH ACCOUNT .. .. .	CXXXII-CXLIII
ASSETS AND LIABILITIES .. .. .	CXLIV

# The Bath and West and

## SUMMARY OF THE CASH ACCOUNT

### WITH COMPARATIVE

Page of accompanying Cash Account.	Dr.	RECEIPTS.	1901. CROYDON.		1900. BATH.	
			£ s. d.	£ s. d.	£ s. d.	£ s. d.
		<b>General Receipts:—</b>				
exxxii		Dividends and Interest . . . . .	537	8 10		544 10
exxxii		Cancelled Cheques, &c. . . . .	10	17 6		
exxxii		Subscriptions from Members . . . . .	1,081	2 0		1,130 14
exxxii		Life Compositions . . . . .	30	0 0		20 0
exxxii		Journal . . . . .	34	12 3		39 14
				1,084 0 7		1,733 0 4
		<b>Show Receipts:—</b>				
exxxii		Implements . . . . .	1,419	18 10		1,676 14
			£ s. d.			
exxxiv		Horses . . . . .	714	3 0		428 5 0
exxxiv		Cattle, Sheep, and Pigs. . . . .	639	10 0		510 15 0
exxxiv		Catalogues, &c. . . . .	83	7 0		83 15 2
				1,437 0 0		1,022 17 8
exxxiv		Poultry . . . . .	96	6 3		91 7 3
exxxiv		Shoeing . . . . .	35	10 0		27 0 0
exxxvi		Arts. . . . .	7	11 9		10 16 0
exxxvi		Art-Union . . . . .	97	19 0		142 0 0
exxxvi		Art-Manufactures. . . . .	76	6 0		106 16 0
				181 16 9		259 12 9
exxxviii		Cheese and Butter. . . . .	93	8 0		123 10 0
exxxviii		Working Dairy . . . . .	153	18 0		131 4 0
exxxviii		Cider . . . . .	10	7 6		20 12 0
exxxviii		Admissions . . . . .	2,028	19 6		3,430 17 0
		<b>Unapportionable:—</b>				
exl		Contract Premiums, &c. . . . .	514	10 0		539 3 0
exl		Stand Fittings . . . . .	284	4 10		292 10 0
				798 14 10		831 19 0
exl		Subscription from Plymouth for 1902 Show	800	0 0		800 0 0
				7,955 19 8		8,435 18 0
exl		<b>Schools</b> . . . . .	..	1,450 12 4		1,338 13 0
exlii		<b>Experiments</b> . . . . .	..	554 0 9		571 9 0
				11,654 13 4		12,000 16 10
exlii		Balance in Bank, Jan. 1 . . . . .	..	382 5 10		754 0 0
exlii		Balance due to Bank, Dec. 31 . . . . .	..	940 0 0		..
				£ 12,978 19 2		12,835 16 0

**Southern Counties Society.****OR THE YEAR ENDING DEC. 31st, 1901.****STATEMENT FOR 1900.**

Page of accompanying Cash Account.			CR.	
	PAYMENTS.		1901. CROYDON.	1900. BATH.
			£ s. d.	£ s. d.
	<b>General Expenses:—</b>			
XXXIII	Salaries . . . . .		775 0 0	775 0 0
XXXIII	Rent, Postage, Stationery, &c. . . . .		260 7 3	223 12 4
XXXIII	Journal . . . . .		431 3 5	430 19 9
			1,466 10 8	1,429 12 1
	<b>Show Expenses:—</b>			
XXXIII	Implements . . . . .		588 18 3	642 11 9
XXXV	Horses . . . . .	£ s. d.		
XXXV	Cattle, Sheep, and Pigs . . . . .	1,280 4 1		1,141 18 0
XXXV	Fodder . . . . .	2,404 2 6		2,330 15 1
		604 3 11		465 1 7
			4,288 10 6	3,937 14 8
XXXV	Poultry . . . . .		263 16 11	248 15 2
XXXV	Shoeing . . . . .		146 19 3	129 14 5
XXXVII	Arts . . . . .	204 19 11		219 0 3
XXXVII	Art-Union . . . . .	186 11 4		237 1 7
XXXVII	Art-Manufactures . . . . .	75 2 0		70 7 6
			466 13 3	526 9 4
XXXVII	Musie . . . . .		277 5 0	272 6 2
XXXVII	Horticulture . . . . .		169 12 0	176 3 5
XXXIX	Cheese and Butter . . . . .		266 8 9	286 10 10
XXXIX	Working Dairy . . . . .		515 13 2	488 11 2
XXXIX	Cider . . . . .		92 16 6	98 10 11
XXXIX	Public Announcements . . . . .		448 9 7	388 0 10
XLII	<b>Unapportionable:—</b>			
	Erection of Offices, &c. . . . .	1,181 19 9		804 2 0
	Carriage of Plant . . . . .	191 9 8		155 15 1
	Stand Fittings . . . . .	135 10 0		120 16 9
	Police . . . . .	89 7 6		94 11 4
	Miscellaneous . . . . .	335 6 6		305 0 7
			1,933 13 5	1,480 5 9
			9,458 16 7	8,675 14 5
XLII	<b>Schools</b> . . . . .		1,308 13 9	1,512 14 4
XLII	<b>Experiments</b> . . . . .		742 18 2	834 16 5
XLII	Balance in Bank, Dec. 31 . . . . .		12,976 19 3	12,452 17 3
			..	382 5 10
			£ 12,976 19 2	12,835 3 1

Audited and found correct,  
ALBERT GOODMAN, F.C.A.,

Auditor.

January 18th, 1902.

Passed by Council,  
January 28th, 1902.

THOS. F. FLOWMAN,

Secretary.

**The Bath and West and****Dr. CASH ACCOUNT FOR THE YEAR ENDING DEC. 31st,**

RECEIPTS.		1901. CROYDON.		1900. BATH.
		£ s. d.	£ s. d.	£ s. d.
DIVIDENDS AND INTEREST:—				
Consols . . . . .		93 18 10		95 3 6
New Zealand Stock . . . . .		51 18 1		52 11 10
India Stock . . . . .		153 9 2		155 9 -
Canada Stock . . . . .		67 14 11		68 12 10
Queensland Stock . . . . .		104 1 10		105 9 4
New South Wales Stock . . . . .		66 6 0		67 3 6
			537 8 10	544 10 8
MISCELLANEOUS:—				
Cancelled Cheques and Sales . . . . .		..	10 17 6	..
SUBSCRIPTIONS FROM MEMBERS:—				
Arrears . . . . .		26 0 0		38 11 0
Governors . . . . .		217 17 0		219 13 0
Subscribers of £1 and upwards . . . . .		819 14 0		853 19 0
Witto of 10s. . . . .		17 11 0		18 11 -
			1,081 2 0	1,130 14 6
LIFE COMPOSITIONS . . . . .				
		..	30 0 0	20 0 0
JOURNAL:—				
Sales . . . . .		12 1 7		11 1 10
Advertisements . . . . .		22 10 8		28 13 1
			34 12 3	39 14 11
IMPLEMENTS:—				
Entry Fees . . . . .		68 10 0		62 10 -
Fees for Space:—				
Machinery-in-Motion Shedding . . . . .		189 10 0		303 0 6
Ordinary . . . . .		340 0 0		379 0 0
Miscellaneous . . . . .		292 10 0		309 7 6
Boarded . . . . .		275 5 0		301 0 0
Seed . . . . .		17 0 0		48 15 1
Uncovered Ground . . . . .		155 9 4		165 7 6
Catalogue Fees and Fines . . . . .		81 14 6		107 14 3
			1,419 18 10	1,676 14 3
Carried forward . . . . .		..	£ 3,113 19 5	

**Southern Counties Society.**

1901, WITH COMPARATIVE STATEMENT FOR 1900.

Cr.

PAYMENTS.	1901. CROYDON.		1900. BATH.
	£	s. d.	£ s. d.
<b>SALARIES:—</b>			
Secretary (Including Clerks, Gas, Coal, Lodgings at Show, &c.) . . . . .	700	0 0	700 0 0
Auditor . . . . .	20	0 0	20 0 0
Consulting Chemist . . . . .	30	0 0	30 0 0
Consulting Botanist . . . . .	25	0 0	25 0 0
		775 0 0	775 0 0
<b>MISCELLANEOUS:—</b>			
Printing . . . . .	35	15 11	33 3 6
Stationery and Finance Books . . . . .	40	18 0	40 6 5
Postages, Telegrams, Cheque and Receipt Stamps . . . . .	77	0 0	68 2 10
Rent of Offices . . . . .	26	0 0	26 0 0
Travelling Expenses . . . . .	29	6 1	30 14 5
Carriage of Goods . . . . .	12	19 6	4 8 1
Directories and Reference Books . . . . .	3	12 9	1 13 5
Finance Committee's Expenses . . . . .	13	17 0	2 17 0
Subscriptions . . . . .	6	6 0	6 6 0
Repairs, &c. . . . .	5	0 6	3 12 2
Hire of London Rooms for Meetings . . . . .	6	8 6	6 8 6
Grant to Tuberculosis Congress . . . . .	3	3 0	..
		260 7 3	223 12 4
<b>JOURNAL:—</b>			
Editor . . . . .	100	0 0	100 0 0
Associate Editor . . . . .	100	0 0	100 0 0
Printing and Binding . . . . .	158	19 1	157 11 1
Plans . . . . .	3	0 0	3 0 0
Journal Distribution . . . . .	27	13 9	30 2 1
Postage, Stationery, Reference Books, &c. . . . .	6	18 7	6 14 7
Payments to Authors . . . . .	34	12 0	33 12 0
		431 3 5	430 19 9
<b>IMPLEMENTS:—</b>			
Shedding . . . . .	493	2 4	550 17 10
Stewards and Assistants . . . . .	52	2 1	61 12 11
Printing, Stationery, &c. . . . .	43	13 10	40 1 0
		588 18 3	642 11 9
Carried forward . . . . .	£ 2,055	8 11	

Dr.

## CASH ACCOUNT—continued.

RECEIPTS.	1901. CROYDON.			1900. BATH.		
	£	s.	d.	£	s.	d.
Brought forward . . . . .	..			3,113	19	5
HORSES, CATTLE, SHEEP, AND PIGS:—						
Horses:—Entry Fees . . . . .	231	10	0	154	15	0
Fines and Forfeits . . . . .	2	0	0	9	0	0
Grand Stand Admissions . . . . .	365	13	0	94	10	6
Special Prizes . . . . .	115	0	0	170	0	0
	714	8	0	428	5	6
Cattle, Sheep, and Pigs:—						
Entry Fees . . . . .	425	0	0	324	5	0
Fines . . . . .	21	0	0	33	0	0
Special Prizes . . . . .	193	10	0	163	10	0
	639	10	0	510	15	0
Catalogues . . . . .	80	7	0	80	12	2
Manure, &c. . . . .	3	0	0	3	3	0
	83	7	0	83	15	2
				1,437	0	0
				1,622	15	8
POULTRY:—						
Entry Fees . . . . .	81	7	6	79	14	6
Special Prizes . . . . .	13	0	0	10	0	0
Commission on Sales . . . . .	1	18	9	1	12	9
	96	6	3	91	7	3
SHOEING:—						
Entry Fees . . . . .	23	10	0	27	0	0
Special Prizes . . . . .	12	0	0	..		
	35	10	0	27	0	0
Carried forward . . . . .	..			4,682	15	8

## CASH ACCOUNT—continued.

C.R.

PAYMENTS.	1901. CROYDON.			1900. BATH.		
	£	s.	d.	£	s.	d.
Brought forward . . . . .	..			2,055	8	11
<b>HORSES, CATTLE, SHEEP, AND PIGS:—</b>						
Horses—Prizes . . . . .	734	0	0			
Shedding and Grand Stand . . . . .	414	18	10			
Stewards and Assistants . . . . .	69	3	6			
Judges . . . . .	61	5	0			
Miscellaneous . . . . .	0	18	9			
	1,280	4	1			
Cattle—Prizes . . . . .	1,165	10	0			
Less deferred . . . . .	2	0	0			
	1,163	10	0			
Sheep—Prizes . . . . .	352	0	0			
Pigs—Prizes . . . . .	223	0	0			
Less deferred . . . . .	2	0	0			
	221	0	0			
Shedding and Canvas . . . . .	481	18	8			
Stewards and Assistants . . . . .	44	14	10			
Judges . . . . .	140	9	0			
Fees returned . . . . .	0	10	0			
	2,404	2	6			
Buildings, &c. . . . .	261	15	0			
Fodder and Insurance . . . . .	212	19	8			
Steward of Fodder and Assistants and Horse hire . . . . .	9	15	6			
Veterinary Inspector . . . . .	19	10	8			
Rosettes . . . . .	10	3	4			
Printing and Stationery . . . . .	69	14	0			
Refreshments to Judges . . . . .	14	5	9			
Deferred Prizes of 1900 . . . . .	6	0	0			
	604	3	11			
	4,288	10	6			
<b>POULTRY:—</b>						
Marquee, Staging and Sheds . . . . .	53	10	0			
Steward and Assistants . . . . .	24	0	3			
Judges . . . . .	12	16	5			
Prizes . . . . .	154	5	0			
Printing, Stationery, Cartage, &c. . . . .	19	5	3			
	263	16	11			
<b>SHOEING:—</b>						
Prizes . . . . .	47	0	0			
Judges . . . . .	8	10	0			
Anvils, Forges, Coals, Horses, Printing, &c. . . . .	19	9	3			
Shedding . . . . .	62	0	0			
Stewards and Assistants . . . . .	10	0	0			
	146	19	3			
Carried forward . . . . .	..			£	6,754	15 7

CROYDON MEETING, 1901. ( cxxxvi )

Dr. CASH ACCOUNT—continued.

RECEIPTS.	1901. CROYDON.			1900. BATH.		
	£	s.	d.	£	s.	d.
Brought forward . . . . .	..			4,682	15	8
ARTS:—						
Catalogues. . . . .	5	0	0		5	0
Commission on Sales and Case Money. . . . .	2	11	9		5	16
				7	11	9
					10	16
ART UNION:—						
Sale of Tickets . . . . .	97	5	0		135	0
Excess paid on Prizes. . . . .	0	14	0		7	0
				97	19	0
					142	0
ART-MANUFACTURES:—						
Fees for Space . . . . .	..			76	6	0
					106	16
Carried forward . . . . .	..			£. 4,864	12	5

CASH ACCOUNT—*continued.*

Clt.

P A Y M E N T S .	1901.			1900.		
	CROYDON.			BATH.		
	£	s.	d.	£	s.	d.
Brought forward . . . . .	..		6,754 15 7			
<b>ARTS:—</b>						
Labour and Fittings . . . . .	66	6	6	58	0	0
Steward and Assistants . . . . .	43	6	9	42	2	19
Hanging and re-packing Pictures . . . . .	25	10	0	31	1	11
Local Agents and Carriage . . . . .	54	13	11	74	4	3
Printing and Stationery, Insurance, &c. . . . .	15	2	9	13	11	3
			204 19 11		219	0 3
<b>ART UNION:—</b>						
Pictures Purchased . . . . .	171	19	8	218	8	1
Printing and Stationery . . . . .	6	16	9	8	11	6
Advertising . . . . .	2	2	0	2	2	0
Commission on Sale of Tickets . . . . .	5	12	11	8	0	0
			186 11 4		237	1 7
<b>ART-MANUFACTURES:—</b>						
Labour and Fittings . . . . .	70	6	0	62	0	0
Steward and Assistants, Printing, &c. . . . .	4	16	0	8	7	6
			75 2 0		70	7 6
<b>MUSIC:—</b>						
Bands and their Fares . . . . .	242	0	0	240	16	8
Erecting Band Stand and Seats and Printing . . . . .	29	10	0	27	15	0
Steward . . . . .	5	15	0	8	14	6
			277 5 0		272	6 2
<b>HORTICULTURE:—</b>						
Gratuities to Gardeners . . . . .	90	0	0	95	0	0
Erecting and Repairing Tent and Staging . . . . .	64	0	0	69	0	0
Steward and Assistants . . . . .	15	12	0	12	3	5
			169 12 0		176	3 5
Carried forward . . . . .	..		£ 7,664 5 10			

Dr.

## CASH ACCOUNT—continued.

RECEIPTS.		1901. CROYDON.		1900. BATH.	
		£	s. d.	£	s. d.
Brought forward				4,864	12 5
CHEESE AND BUTTER:—					
Entry Fees		47	12 6	95	7 6
Cheese and Butter Sales		20	10 6	23	12 6
Special Prizes		24	0 0	4	0 0
Fines.		1	5 0	0	10 0
				93	8 0
				123	10 0
WORKING DAIRY:—					
Admissions		6	0 6	10	17 0
	£ s. d.				
Entry Fees, Competitions		38	7 6	35	2 0
Ditto Dairy Appliances		5	5 0	5	5 0
Ditto Milk and Butter Tests		30	5 0	19	0 0
		73	17 6	59	7 0
Sale Premium		20	0 0	15	0 0
Special Prizes and grant for demonstrations.		54	0 0	46	0 0
				153	18 0
				131	4 0
CIDER:—					
Entry Fees		8	17 6	18	17 6
Fines		1	10 0	1	15 0
				10	7 6
				20	12 6
ADMISSIONS TO SHOW-YARD:—					
Admissions at 5s.		189	0 0	146	15 0
Ditto at 2s. 6d.		1,111	1 6	1,367	7 6
Ditto at 1s.		1,357	8 0	1,664	7 0
Children at 1s.		25	0 0	34	2 0
Ditto at 6d.		88	12 6	88	3 6
Season Tickets		157	17 6	130	2 6
				2,828	19 6
				3,430	17 6
Carried forward		£	8,051 5 5		

**CASH ACCOUNT—continued.**

Cr.

P A Y M E N T S.	1901. CROYDON.			1900. BATH.		
	£	s.	d.	£	s.	d.
Brought forward . . . . .	..			7,668	5	10
<b>CHEESE AND BUTTER:—</b>						
Judges . . . . .	12	19	3	11	0	0
Prizes . . . . .	167	0	0	171	16	0
Steward and Assistants . . . . .	16	6	6	19	10	2
Shedding . . . . .	69	15	0	71	15	0
Printing, Stationery, Carriage, &c. . . . .	5	8	0	6	17	2
Grass Table for Butter . . . . .	5	0	0	5	12	6
				266	8	9
				286	10	10
<b>WORKING DAIRY:—</b>						
Steward and Assistants . . . . .	54	2	6	49	9	2
Judges and Demonstrators . . . . .	77	16	10	67	7	2
Building . . . . .	245	7	11	241	3	8
Printing, Stationery, Postage, and Insurance . . . . .	11	8	9	10	10	3
Utensils, Carriage, &c. . . . .	20	2	6	23	5	5
Prizes . . . . .	81	4	2	85	9	2
Coal, Salt, Ice, &c. . . . .	7	9	2	7	15	10
Consulting Chemist for Analyses . . . . .	12	0	10	3	10	6
Milk and Churners for Churnability Test . . . . .	6	0	6	..		
				515	13	2
				488	11	2
<b>CIDER:—</b>						
Shedding and Fittings . . . . .	50	9	11	41	10	0
Steward and Assistants . . . . .	7	17	0	6	5	0
Judge . . . . .	6	17	9	6	0	0
Prizes . . . . .	7	1	10	10	16	6
Printing, &c. . . . .	6	14	0	8	6	0
Analyses and Carriage . . . . .	13	16	0	27	13	5
				92	16	6
				98	10	11
<b>PUBLIC ANNOUNCEMENTS:—</b>						
Advertising . . . . .	203	18	11	190	6	1
Billposting . . . . .	150	9	11	119	6	9
Railway Placards . . . . .	37	10	0	25	14	6
Printing . . . . .	52	10	9	48	13	6
Rent of Placard-Frame Stores . . . . .	4	0	0	4	0	0
				448	9	7
				328	0	10
Carried forward . . . . .	..			£ 8,991	13	10

CROYDON MEETING, 1901.

( exl )

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.	1901. CROYDON.			1900. BATH.	
	£	s.	d.	£	s.
Brought forward . . . . .	..		8,051	5	5
SHOW RECEIPTS (UNAPPORTIONABLE):—					
Stand-fittings . . . . .		284	4	292	10
Contract Premiums . . . . .		514	10	559	3
			798	14	10
SUBSCRIPTIONS FROM TOWNS:—					
Plymouth for 1902 Show . . . . .	..		800	0	0
SCHOOLS:—					
SOMERSET FARRIERY:—		£	s.		
Students' Fees . . . . .			1	5	6
Grant from County Council . . . . .		155	12	153	19
			156	17	6
SOMERSET CHEESE:—					
Students' Fees . . . . .		70	12	118	10
Cheese and Butter sold . . . . .		664	1	633	13
Ditto (1900 draft) . . . . .		255	7	103	10
Sale of appliances (1900) . . . . .			2	11	0
Sale of Students' Note-Books . . . . .			1	2	6
Grant from County Council . . . . .		300	0	300	0
			1,293	14	10
				1,450	12
Carried forward . . . . .	..		£ 11,100	12	7

CASH ACCOUNT—*continued.*

CR.

PAYMENTS.	1901. CROYDON.		1900. BATH.	
	£	s. d.	£	s. d.
Brought forward. . . . .	..	8,991 13 10		
SHOW EXPENSES (UNAPPORTIONABLE):—				
Erecting Offices and other Buildings . . . . .	954	13 8	643	13 3
Mito Hoarding . . . . .	227	6 1	160	8 9
Carriage of Plant . . . . .	191	9 8	155	15 1
Steward of Works, &c. . . . .	12	8 3	12	7 0
Stand Fittings . . . . .	135	10 0	120	16 9
Extension of Telegraph Wires . . . . .	11	2 11	12	19 5
Insurance of Plant . . . . .	4	10 0	4	10 0
Hire of Furniture . . . . .	30	14 0	39	3 5
Mess Room, &c.. . . .	5	5 0	5	5 0
Gatekeepers, Yardmen, Messengers, &c. . . . .	82	2 6	76	5 5
Steward of Finance and Treasurer . . . . .	21	11 3	17	0 6
Finance Office and Treasurer's Clerks . . . . .	44	8 4	34	8 10
Police . . . . .	89	7 6	94	11 4
Badges . . . . .	3	15 9	3	8 8
Catalogues for Press and Officials . . . . .	8	16 0	8	10 6
Purchase of Plant . . . . .	20	16 2	12	2 3
Printing and Stationery . . . . .	54	15 8	48	9 9
Commission on Sale of Season Tickets. . . . .	5	4 10	2	17 5
Sundries . . . . .	5	0 1	3	12 5
Fruit Drying Demonstrations . . . . .	24	15 9	..	..
Local Grant . . . . .	..	..	20	0 0
		1,933 13 5	1,490	5 9
SCHOOLS:—				
SOMERSET FARRIER:—				
	£	s. d.		
Instructor . . . . .	30	13 4	135	10 11
Veterinary Surgeon. . . . .	31	10 0	31	10 0
Coal, Iron, &c. . . . .	8	18 3	13	17 4
Carriage and Cartage . . . . .	2	18 1	14	8 3
Rent of Yard and hire of Horses . . . . .	3	19 0	16	1 0
Prizes and Judges at Competitions . . . . .	12	0 2	16	19 3
Printing, Stationery, Postage, Office } and Travelling Expenses . . . }	30	17 0	61	16 9
Plant, Repairs, and Fittings . . . . .	0	3 0	6	8 0
		120 18 10	296	11 6
SOMERSET CHEESE:—				
Salaries and Expenses . . . . .	130	7 0	152	16 10
Steward's Time and Expenses . . . . .	62	16 4	42	9 6
Balliff's Wages . . . . .	39	6 0	50	0 0
Office Staff and Travelling . . . . .	45	0 6	39	7 8
Milk . . . . .	779	11 0	802	13 2
Rennet, Bandages, Coal, Salt, &c. . . . .	23	1 7	23	13 7
Carriage of Plant . . . . .	4	14 6	1	19 6
Printing, Stationery, Advertising, } Postages and Telegrams . . . }	17	2 0	18	16 2
Students' Board . . . . .	49	10 0	73	16 0
Repairing and replacing Plant and } Fittings . . . . . }	36	6 0	10	10 4
		1,187 14 11	1,216	2 10
		1,308 13 9	1,512	14 4
Carried forward . . . . .	..	£ 12,234 1 0		

CROYDON MEETING, 1901. ( cxlii )

Dr.

CASH ACCOUNT—*continued.*

RECEIPTS.				1901. CROYDON.				1900. BATH.					
				£	s.	d.	£	s.	d.	£	s.	d.	
Brought forward				..			11,100	12	7				
EXPERIMENTS:—													
FIELD				..			..			156	4	1	
MANURES AND MUTTON:—													
Sale of Sheep				242	19	5				174	18	9	
Sale of Wool				10	1	6				15	7	0	
Returned on Carriage				0	19	10							
Government Grant (1900)				75	0	0				125	0	0	
Ditto (1901)				25	0	0				..			
							354	0	9		315	5	9
CIDER:—													
Government Grant							100	0	0		100	0	0
DAIRY RESEARCH:—													
Grant from County Council							100	0	0				
										554	0	9	
										671	9	10	
							11,654	18	4	12,000	16	10	
Balance in Bank, Jan. 1				..			382	5	10	754	6	3	
Balance due to Bank, Dec. 31				..			940	0	0	..			
							£ 12,976	19	2	12,835	3	1	

## CASH ACCOUNT—continued.

CR.

P A Y M E N T S.	1901.			1900.		
	CROYDON.			BATH.		
	£	s.	d.	£	s.	d.
Brought forward . . . .	..	12,234	1 0			
<b>EXPERIMENTS:—</b>						
FIELD:—	£	s.	d.			
Manures and Seeds . . . .	4	4	6	10	3	4
Printing and Stationery . . . .	22	0	6	24	14	0
Steward, Office, Travelling, Post- age, &c. . . . .	29	0	1	37	12	2
Consulting Chemist . . . . .	1	0	0	1	0	3
Botanical Visitor . . . . .	18	16	8	17	19	0
Rent, Labour, and Occupier's Ex- penses . . . . .	..			108	0	0
	75	1	9	199	8	9
<b>MANURES AND MUTTON:—</b>						
Capital Account—						
Fencing and Appliances . . . .	4	18	2	267	10	5
Current Account—						
Rent of Fields, Manures and Car- riage. . . . .	88	1	5	37	2	6
Sheep and expenses of ditto . . .	245	7	3	174	5	3
Steward and Postage . . . . .	27	12	2	23	19	7
Shepherding, &c. . . . .	10	14	6	9	15	6
Office, Printing, &c. . . . .	23	10	0	..		
	400	3	6	512	13	3
<b>CIDER:—</b>						
Expert . . . . .	80	0	0	80	0	0
Fittings . . . . .	16	0	0	16	0	0
Office and Travelling . . . . .	9	6	8	11	17	5
Printing and Postage . . . . .	17	13	6	14	17	0
	123	0	2	122	14	5
<b>DAIRY RESEARCH:—</b>						
Expert and Assistant . . . . .	118	10	10			
Apparatus . . . . .	5	15	3			
Office and Postage . . . . .	20	6	8			
	144	12	9			
		742	18 2	834	16	5
		12,976	19 2	12,452	17	3
Balance in Bank, Dec. 31, 1901 . . . .	..	..		382	5	10
	£	12,976	19 2	12,835	3	1

I hereby certify that I have examined the foregoing accounts for the year ending Dec. 31st, 1901, compared the payments entered with the vouchers, and found them all in order and correct.

Jan. 1st, 1902.

ALBERT GOODMAN, F.C.A.,

Auditor.

Passed by Council,

Jan. 28th, 1902.

THOS. F. PLOWMAN,

Secretary.

## CROYDON MEETING, 1901.

## CROYDON MEETING, 1901.

## ASSETS AND LIABILITIES TO DECEMBER 31st, 1901, WITH COMPARISON FOR 1900.

ASSETS.	1901. CROYDON.		1900. BATH.		LIABILITIES.		1901. CROYDON.		1900. BATH.	
	£	s. d.	£	s. d.			£	s. d.	£	s. d.
INVESTMENTS . . . . .	16,987	4 7	16,987	4 7	DEFERRED PRIZES . . . . .		4	0 0	9	0 0
<i>Par Value.</i>										
<i>Actual Cost.</i>										
New Zealand Stock 1,568 1 6	1,500	0 0								
Consols. . . . .	3,001 4 0	3,200 19 6								
India Stock . . . . .	5,408 6 4	5,277 5 1								
Canada Stock . . . . .	1,700 13 4	2,000 0 0								
Queensland Stock . . . . .	2,751 9 0	3,000 0 0								
N. S. Wales Stock . . . . .	1,752 8 10	2,000 0 0								
	16,272 3 0	16,987 4 7								
PLANT (WORKS) . . . . .		515 11 6	532	1 0	JOURNAL, cost of, estimated at . . . . .		450	0 0	450	0 0
Do. (DAIRY) . . . . .		10 11 3	20	14 1						
			532	2 9						
SUBSCRIPTION ARREARS . . . . .			126	15 6						
DUE FROM COUNTY COUNCILS ON } SCHOOLS ACCOUNTS. . . . .			35	18 8	UNPAID ACCOUNTS . . . . .		6	18 0		
GOODS IN HAND (CHEESE) . . . . .		200 0 0	255	0 0						
CHEESE-MAKING APPARATUS . . . . .		20 0 0			DUE TO BANK, Dec. 31 . . . . .		940	0 0		
			220	0 0						
BALANCE IN BANK, DEC. 31 . . . . .	17,866	2 10	17,492	12 4	BALANCE . . . . .		2,200	18 0	1,250	0 0
			362	5 10			15,065	4 10	17,045	18 2
			£17,866	2 10			£17,866	2 10	£16,304	18 2

Audited and found correct.  
JENNIE BISH, WMT. ALBERT GOODMAN, F.C.A., Auditors.Passed by Council.  
JENNIE BISH, WMT. ALBERT GOODMAN, Secy. Treas.

# Bath and West and Southern Counties Society,

FOR THE

*Encouragement of Agriculture, Arts, Manufactures, and Commerce.*

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CORRECTED TO JANUARY 28TH, 1902, INCLUSIVE.

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(10)

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Halsey, E. J. . . . .	104, Drayton Gardens, London, S.W. . . . .	1 0 0
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Name.	Residence.	Subscriptions.
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Mirehouse, H. . . . .	St. George's Hill, Easton-in-Gordano . . . . .	1	0	0
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*Subscriptions.*

clxv

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Name.	Residence.	Sub-
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		£ s. d.
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Name.	Residence.	Subscriptions.		
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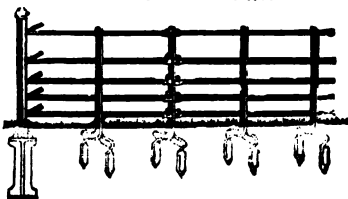
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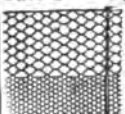
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